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# BULLETIN

OF THE

# ESSEX INSTITUTE,

## VOLUME XII.

1880.

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# BULLETIN

OF THE

# ESSEX INSTITUTE.

VOL. 12. SALEM, JANUARY–JUNE, 1880. NOS. 1–6.


REGULAR MEETING, MONDAY, JAN'Y 19, 1880.

MEETING this evening. PRESIDENT in the chair. Records read. Donations and correspondence announced.

Mrs. Margaret Braden and Arthur West, both of Salem, were elected resident members.

Vice President, D. B. HAGAR, read a paper on "*Spelling Reform.*" He commenced by saying that it was too late for sensible men to laugh at the spelling reform. He named a large number of eminent scholars in England and in America who are its advocates, and designated prominent educational bodies who have officially favored its consideration. He alluded to several well known leading newspapers as having adopted some of the proposed new spelling, mentioning the *Chicago Tribune*, the *Utica Herald*, the *N. Y. Independent*, the *Journal of Education* and the *Home Journal*, and stated what had been done by educational associations in behalf of the reform. The following propositions were then advocated:

(1) That spoken language necessarily precedes written

language. (2) That the grand purpose of written language is to represent to the eye the spoken language, as heard by the ear. (3) That the written language should be so constructed that the transition from the spoken to the written, and, conversely, from the written to the spoken, should be simple, uniform, and truthful. (4) That, to this end, a phonetic system is the most direct, easy, and rational. (5) That in devising a written language for a people hitherto without one, no sensible scholar would, at the present day, think of framing it on any principle other than the phonetic. (6) That the present orthography of the English language is so lawless, so perplexing, so confounding to all rational expectation, that the learner is compelled, from first to last, to guess at the pronunciation of every new word he sees; that he cannot be certain of correctness until assured by his teachers, and possibly not even then.

Under this last point, numerous illustrations of irregularity and inconsistence in English spelling were given. It was shown that the present orthography of the English language employs sixty-two signs, which have at least one hundred and fifty-nine uses; whereas a pure phonetic system would, therefore, save a vast amount of time in learning to read and spell.

Mr. Hagar then proceeded to answer the objections usually urged against a reform of English orthography, endeavoring to show that they were of little importance.

The paper closed by answering the question, What can be done toward accomplishing the desired reform? Something could be done in the following ways: (1) By the general discussion of the subject among teachers and other friends of education. (2) By establishing spelling-reform associations throughout the country. (3) By concert of action among State and County educational

associations. (4) By procuring the appointment of National and State Commissions to consider and report on the subject. (5) By personally adopting in our correspondence the spellings recommended by the American Philological Association. (6) By freely using the public press toward setting before the public the objects and merits of the proposed reform. (7) *By teaching the children in the public schools to read from a phonetic text.* (8) By cherishing the pluck and aggressiveness of earnest reformers.

Prof. E. S. Morse spoke of the Japanese language, showing that students there had to surmount even greater obstacles than obtain in the present English system.

Mr. James Kimball exhibited and explained Wilson's Ozone Generator and Diffuser. This apparatus is intended to be used in destroying the impurities in the air of close and poorly ventilated rooms, also the noxious emanations produced by the decomposition of animal and vegetable substances. It is a machine holding six small cups partly filled with water, a stick of prepared phosphorus being placed in each cup. Upon the ignition of the phosphorus a cover of porous porcelain is placed over the cups and the apparatus is prepared to do its work.

Regular Meeting, Monday, February 16, 1880.

President in the chair. Records read. Donations and correspondence announced.

At an adjournment on Tuesday, Feb. 17, Charles Toppan, of Salem, was elected a member.

The Secretary read a communication from the American Academy of Arts and Sciences, inviting the Essex Institute to select one or more delegates to attend the celebration of its 100th anniversary to be held in Boston on the 26th of May, 1880.

On motion of Mr. F. W. Putnam, the selection of delegates was referred to a committee, consisting of the President and Secretary.

A similar invitation was read from the Minnesota Historical Society, which will celebrate the 200th anniversary of the discovery of the Falls of St. Anthony, on the 3rd day of July, 1880, to send a representative on that occasion. The subject was referred to the same committee with power to act.



Regular Meeting, Monday, March 1, 1880.

Meeting this evening. The President in the chair. Records read. Donations and correspondence announced.

Vice President F. W. Putnam made a communication of peculiar interest, but of which only a brief abstract of some portions is here given. His subject was "The former Indians of Southern California, as bearing on the origin of the Red Man in America."

After giving an account of the discovery of the Peninsula of California, in 1534, by an expedition fitted out by Cortés, he gave an historical résumé of the military expeditions to Upper California, the establishment of the missions by the Jesuits and Franciscans, and of their degrading influence on the Indians.

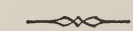
He then called attention to the facts relating to the antiquity of man on the Pacific coast, and to the importance

of the discovery in California of human remains and of the works of man under beds of volcanic material, where they were associated with the remains of extinct post-pliocene animals, and to the necessity of looking to this early race for much that it seems otherwise impossible to account. He thought that what is called the "Eskimo element," in the physical characters and arts of the southern Californians, was very likely due to the impress from a primitive American stock, which is probably to be found now in its purest continuation in the Innuit. In this connection he dwelt upon the probability of more than one type of man. In following out this argument, he called attention to the distinctive characters in different tribes of Indians on the Pacific coast, and stated his belief that they had resulted from an admixture of the descendants of different stocks. The Californians of three hundred years ago, he thought, were the result of development by contact of tribe with tribe through an immense period of time, and that the primitive race of America, which was as likely autochthonous and of pliocene age, as of Asiatic origin, had stamped its impress on the people of California. The early races of America he believed were dolichocepali, and the short-headed people he thought were made up of a succession of intrusive tribes in a higher stage of development, which in time overran the greater part of both North and South America, conquering and absorbing the long-headed people, or driving them to the least desirable parts of the continent. He thought that the evidence was conclusive that California had been the meeting ground of many distinct tribes of the widely spread Mongoloid stock; for in no other way could he account for the remarkable commingling of customs, arts and languages, and the formation of the large number of petty tribes

that existed in both Upper and Lower California when first known to the Spaniards.

The speaker then gave a review of the arts of the Californians and the physical characters and customs of the people, showing that, notwithstanding the absence of pottery, the tribes, when first known, had passed through the several stages of savagery and had reached the lower status of barbarism, as defined by Mr. L. H. Morgan in his "Ethnical periods."

Mr. Putnam concluded by calling attention to the recent explorations of the coast of southern California and the adjacent islands, by the expedition under Lieut. Geo. M. Wheeler of the U. S. Engineers, in charge of the Survey West of the 100th Meridian, and the extended explorations of the Santa Barbara Islands which had been conducted by the Peabody Museum of Archæology at Cambridge. The results of these explorations, he stated, were now embodied in the seventh volume of the Reports of the Survey under the charge of Lieut. Wheeler, and published, by authority of Congress, under the direction of the Chief of Engineers, U. S. A.



FRIDAY, MARCH 11, 1880.

MEETING this evening. The PRESIDENT in the chair.

Rev. ROBERT COLLYER, of New York, read an interesting paper entitled "An Episode in the life of Edward Fairfax."

The PRESIDENT, before introducing the lecturer of the evening, briefly alluded to William Fairfax, a lineal de-

scendant of Thomas, the first Lord Fairfax, who was an elder brother of Edward, an episode in whose life is the subject of the paper under consideration. William Fairfax was the son of Hon. Henry Fairfax, sheriff of Yorkshire, who was the son of Henry, the fourth Lord Fairfax. Having received the appointment of collector of the port of Salem, he came to Salem in 1725 from the Bahamas, where he had married Sarah, daughter of Major Walker, and was appointed Chief Justice of the Island. His wife died in Salem in 1731, and subsequently he married Deborah, daughter of Francis and Deborah (Gedney) Clarke. In 1734 he accepted an offer from his cousin Thomas, the sixth Lord Fairfax, to be the superintendent of the estates in Virginia, which he had inherited from his mother, who was a daughter of Lord Culpepper. He then removed thither and took up his residence first in Westmoreland County, but subsequently removed to a plantation called Belvoir, near Alexandria.

During his residence in Salem he occupied the house which was taken down some eight years since, on the western corner of Essex and Cambridge streets, for the erection on the site of a more eligible mansion. The house was then owned by Philip English, or his daughter Susannah Touzel.

For a more extended notice of the Clarke Family and its connection with the Fairfax, the reader is referred to a notice of the Clarke and Gedney families, prepared by H. F. Waters, and printed in the Historical Collections of the Essex Institute, Vol. XVI, part 4.

Mr. Collyer gave at first a very graphic account of the ancient seat of the Fairfax family at Denton Park in Yorkshire. He spoke of several of the members of the family, particularly Thomas, the third Lord Fairfax,

who was the great General of the Parliament Army, 1645 to 1650—born in Denton, 17 Jan'y, 1611–12, died at Belburgh, near York, 12 Nov., 1671, and Thomas the sixth Lord Fairfax who resided for many years on his estates in Virginia and was the intimate friend and patron of Washington and who died at Greenway Court near Winchester, Va., in 1781, aged ninety-one years.

Edward Fairfax, the poet, born at Denton, Yorkshire, and died in the Parish of Fewston about 1631. The consideration of his writings was the leading and principal topic discussed in this communication. He seems to have preferred a life of study and retirement to that of military service in which his brothers and other members of the family were distinguished. Having married he lived at Fewston and there spent his time in literary pursuits. His best known production is a translation of Tasso's poem of "Jerusalem Delivered," which appeared in 1600 and was received with enthusiastic and continued approbation. Its popularity has revived in the present century and several editions have appeared in England and the United States. His work on demonology entitled "A Discourse of Witchcraft, as it was acted in the family of Mr. Edward Fairfax of Fewston, in the county of York, in the year 1621," was particularly noticed and fully explained, giving a very interesting and instructive sketch of the condition of witchcraft at that period.

Edward Fairfax was a firm believer in witchcraft. He imagined that some of his children had been bewitched; and he had some of the witches brought to trial, though without obtaining a conviction. He, however, only shared in the common superstitions of the age and was settled in the conscience of having the sure ground of God's word to warrant all he believed, and the commendable ordinances of the English church to approve all he practised.

## Regular Meeting, Monday, March 15, 1880.

Regular meeting this evening. President in the chair. Records read. Correspondence and donations announced.

Hon. Thomas H. Walker of Pottsville, Penn., read an interesting paper on "The Philosophy and Theory of Punishment." To this subject he had given much time, wide research and serious reflection. He began by alluding to the lax system of prison discipline which prevailed in Europe a century ago, when the jails were nothing but moral pest-houses, where drunkenness and prostitution were the pastime of the inmates; where the innocent and guilty were huddled together in common quarters. At this time Howard, the great apostle of prison reform, came upon the scene of action in England. He visited most of the prisons in Europe and presented such a startling array of facts in reference to prison life, that he was summoned before Parliament and examined with great particularity in regard to his investigations.

The result was the appointment of a Parliamentary commission and the establishment of the true theory of prison discipline, the reformation of the criminal and the protection of society. Human nature was the same inside the prison as outside, actuated by the same motives and resentments. The criminal should, therefore, when practicable, be sentenced to solitary confinement at labor:— solitary confinement in order that he may have opportunity to repent of the enormity of his crimes and his responsibility to the State, and that any good impressions which may be created shall not be dispelled by the scoffs and frivolity of the hardened criminals; and labor, as well as solitude, that he may be taught the value of industry, and learn to appreciate the blessing of the

sentence pronounced upon man "In the sweat of thy brow shalt thou eat thy bread." Brief terms of improvement as a rule were advocated, especially in the case of the young, and at this point the very groundwork of the whole system was reached. The intellectual and moral education of the young was the most effective method of reform. Crime was hereditary like any other disease; our penitentiaries and jails are crowded with the ignorant and depraved, and it would be good economy for the state to gather up the homeless and fatherless children in our large cities, and endeavor to make good men and women of them. There has been a great advance in providing for the physical comfort and treatment of the inmates of our prisons. The sick are cared for in well-lighted and cheery infirmaries. The insane criminals are no longer confined in dungeons and fettered with chains, but are sent to asylums for appropriate treatment. But we need go a step farther; crime is a mental disease and needs a careful diagnosis for its successful eradication, and our system of prison discipline has much to learn in this respect.

The lecturer closed with an eloquent tribute to the memory of Howard, to whom the world owes so much for the alleviation of prison discipline.

At the adjournment on Tuesday, March 16, Mrs. Jerome Carter and Miss L. F. Tyler, both of Salem, were elected members.

Votes of thanks were passed to Rev. Robert Collyer, of New York, for his interesting paper "An Episode in the life of Edward Fairfax," and to Hon. Thomas H. Walker, of Pottsville, Penn., for his valuable paper on "Prison Discipline."

# *A List of the Birds of the Hudson Highlands, with Annotations.*

By Edgar A. Mearns.

[Continued from page 204, Vol. XI.]

**72. Ægiothus linaria** (*Linné*). Red-poll Linnet; Lesser Red-poll. An occasional winter visitant; sometimes very abundant.

In 1874, the Lesser Red-polls appeared in flocks about the first of December, and were very abundant until April. For some time after their first appearance, very few adults were seen, nearly all being young birds; but soon old males with rosy breasts and ruby crowns began to come in immense flights, till the swamps of birch-trees which they inhabited, and upon whose seeds they fed, were absolutely swarming with them. So great were their numbers that the supply of birch seeds soon gave out, and then they scattered over the entire region, feeding largely upon seeds of the alder, and of various weeds. During the month of March, the Red-polls far exceeded in numbers the aggregate of any single species that I have ever seen. They were very tame, feeding close to the roadsides and in yards about houses; and, go where one would, they were always found in abundance. They were in full song during the last month of their stay, and the males were in particularly handsome plumage. Their notes resemble those of the American Goldfinch (*Chrysomitris tristis*); but their flight is swifter, and less undulating. They are easily domesticated, and make nice pets.

Mr. William C. Osborn shot a female, on November 9, 1878, near Garrisons; it was feeding in company with the Tit-lark (*Anthus ludovicianus*), in a weedy field near the Indian Brook.

I saw a single Red-poll in a birch-tree in the Central Park, N. Y., on December 20, 1878. During the last week in December and the first day of January (1878–79), they were quite numerous all through the Highlands. Nearly all of the specimens shot were young males, though one or two adult males and females were secured. Dr. Fisher, on the other hand, found only females, at the same time, at Sing Sing, N. Y. On February 8, 1879, Dr. Clinton L. Bagg found a number of Red-polls in some weedy fields on Ward's Island, N. Y.

*Dimensions.*—Average measurements of fifty-seven specimens:—length, 5·32; stretch, 8·68; wing, 2·80; tail, 2·32; culmen, ·36; tarsus, ·56: middle toe, ·36; its claw, ·23.

**73. Chrysomitris pinus** (*Wilson*). PINE GOLDFINCH; PINE LINNET. An occasional winter visitant; sometimes a winter resident, and abundant.

In 1874 the Pine Linnets were found in the hemlocks, feeding upon the cones, as early as October 16. They were frequently met with throughout the winter in large flocks in the alder swamps, accompanying flocks of Red-poll Linnets. Since then I have only seen them on two occasions: in Lewis County, N. Y., January 1, 1878; and on February 6 (same year), when they were numerous at Fort Montgomery (four miles south of Highland Falls), associating and feeding with large flocks of Yellowbirds (*Chrysomitris tristis*) upon the cones of the hemlock.

A specimen was taken by Mr. Frederic S. Osborn at Garrisons, October 17, 1874; and Mr. William C. Osborn took specimens there on November 16, 1878. Mr. Theodore Roosevelt took it August 27, 1874, in Franklin County, N. Y.[1]

Dr. C. Hart Merriam's notice of the "Breeding of the Pine Linnet in Northern New York," published in the "Forest and Stream and Rod and Gun" (Vol. X, No. 24, p. 463, July 18, 1878), is so interesting that I cannot forbear transcribing it entire: "Few birds are more erratic in their habits than the siskin or pine linnet. Occurring to-day, perhaps, in such numbers that one soon tires of shooting them, they are gone on the morrow, and years may elapse before one is seen again. There is, in their melancholy *che-a*, uttered at intervals as small flocks pass in short, waving swoops, far overhead, something sadly suggestive of the cold bleak winds that sweep their northern homes. Yet they are warmly clad, and seem rather to enjoy the wintry blasts that compel most birds to seek a milder clime; and their roaming movements are apparently governed more by some idiosyncrasy in their roving dispositions, and abundance or scarcity of food, than by the severity of the season in the region from which they came.

During the past winter and spring they literally swarmed in Lewis County, N. Y., and thousands of them bred throughout the heavy evergreen forests east of Black River, while many scattered pairs nested in suitable hemlock and balsam swamps in the middle district. They breed remarkably early, and construct large, compact nests, which are usually placed high up on some hemlock or spruce, and well concealed from view. I know of no nest, of equal size, so hard to find. After days of patient search in the evergreen swamps of this vicinity (Locust Grove), Mr. Bagg and myself discovered but a

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[1] The Summer Birds of the Adirondacks in Franklin County, N. Y. By Theodore Roosevelt, Jr., and H. D. Minot.

single nest. On the 13th of April we were hunting in a low swamp, near White River, when a solitary pine linnet attracted our attention by hopping about on some fallen logs. In a few moments she flew into a large hemlock, which stood apart from the rest, and immediately disappeared. After carefully looking over the entire tree, a limb at a time, Mr. Bagg noticed a bunch of something almost completely concealed by a cluster of small branches. We were not sure that it was a nest at all till a well-aimed stick drove off the parent bird, which was shot and proved to be the female. With great difficulty the nest was secured, and it contained, at that early date (April 13), two nearly fledged young. It was tightly saddled on a large limb, about thirty feet from the ground and nearly fifteen feet from the trunk of the tree, and was so nicely hidden that, from a limb directly above, I could not see it at all. One of the young was skinned, while the other now constitutes a contented member of my sister's "happy family," which previously consisted of an oriole (*Icterus baltimore*), three thistlebirds (*Chrysomitris tristis*) and a nonpareil (*Cyanospiza ciris*). He attained his full growth shortly after his capture, and has since thrived on a mixed diet, though, like his cousins the goldfinches, showing a decided preference for the thickly-seeded spikes of the common plantain (*Plantago major*). Also, like his brighter-plumaged companions, he constantly raises and lowers the occipital feathers when at all alarmed.

In plumage he differs from the adult bird, in having the belly marked with yellow, the wing-bars ochraceous instead of whitish, and the upper parts decidedly tinged with rufus. This rufus cast is due to the fact that the bark-centred feathers of the back are, in the young, margined with fulvous-brown, which is not the case with the old bird. The nest is a very bulky structure for so small a bird, and its rough exterior, loosely built of hemlock twigs, with a few sprigs of pigeon moss (*Polytrichum*) interspersed, is irregular in outline, and measures about six inches in diameter. The interior, on the contrary, is compactly woven into a sort of felt, the chief ingredients of which are thistledown and the fur and hair of various mammals. The cavity is lined with horsehair, and measures two inches and a quarter in diameter by an inch and a quarter in depth. This nest is much more flat than that described by Dr. Brewer[2] from Cambridge, Mass., for it measures but two inches in height at its highest point. A considerable mass of dung adheres to the small twigs at one point in its exterior, showing that the bird always "headed" the same way, and was not particularly cleanly in her habits. From the size of the

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[2] Baird, Brewer and Ridgway, Vol. I, p. 482, 1874.

young it is clear that this nest could not have been completed much later than the middle of March.

Not content to let the season pass without making a greater effort to secure their eggs, I accepted on the 15th of April, an invitation from my brother, C. Collins Merriam, to accompany him on an excursion through the densely timbered region about Otter Creek (near the eastern border of Lewis County) and Big Otter Lake (Herkimer County), from which it takes its origin. This entire district lies within the area commonly known as "Brown's Tract," and is Canadian in fauna. Never before at any locality have I seen a species of bird represented by such immense numbers of individuals as here attested the abundance of the pine finch. In every part of the forest, from early in the morning till after the sun had disappeared in the west, there was not a moment that their voices were not heard among the pines and spruce trees overhead. And yet, though among them several days, we were not able to discover a single nest. Never have I searched more faithfully for the eggs of any species, and never has my diligence been rewarded with less success. I at first made a systematic survey of a large number of trees, taking a limb at a time, and then climbed so many that I was barely able to get back to camp, but with no better results.

Their nests are placed so high and amidst such thick evergreen foliage that it is almost impossible to find them. As illustrating the number of this species as well as of the red and white-winged crossbills (*Loxia curvirostra* var. *Americana* and *L. leucoptera*), it may be worth recording that after firing twenty-two small charges of fine dust shot at the cross-bills as they settled into the top of a single dead hemlock, I picked up fifty-one birds, of which twenty-eight were red cross-bills, eight white-winged, and fifteen pine linnets. I aimed at cross-bills only, killing the linnets by chance. Mr. A. J. Dayan was so fortunate as to secure two sets of their eggs from among the pines near Lyon's Falls (in the Black River Valley). The first was completed March 11, and contained but three eggs on the 18th. The second contained two fresh eggs April 20, and was left till the 25th, but no more were deposited."

*Dimensions.* — Average measurements of eleven specimens: length, 5·00; stretch, 8·63; wing, 2·76; tail, 1·90; culmen, ·43; gape, ·47; tarsus, ·52; middle toe, ·45; its claw, ·23.

**74. Astragalinus tristis** (*Linné*). American Goldfinch; Yellowbird. A permanent resident; breeds; common.

This pretty species, in winter, associates in flocks, feeding upon the seeds of birch, alder and hemlock, besides those of numerous weeds. They are not generally recognized in their plain, but neat winter dress, as the gayly-attired Yellowbirds of summer. In winter,

large numbers are sold in the New York markets, in bunches, under the name of "reed-birds."

*Dimensions.*—Average measurements of twenty-nine specimens: length, 5·10; stretch, 8·83; wing, 2·82; tail, 1·95; culmen, ·40; gape, ·43; tarsus, ·54; middle toe, ·42; its claw, ·21.

**75. Plectrophanes nivalis** (*Linné*). Snow Bunting; White Snowbird. An irregular winter visitant. It sometimes arrives early in November, and remains until March. Mr. Thomas W. Wilson procured specimens on the railroad, at Constitution Island, as early as November 8, 1875. Mr. William Church Osborn saw them near Garrisons, on November 9, 1878. I have seen flocks on the railroad as late as March 12 (1875).

Large numbers of these white-clad visitors from Arctic climes occasionally appear upon the ice of the frozen Hudson: always in severely cold weather, and very often during snow-storms. During the latter part of the winter of 1874-5, when skating up the river, I found large flocks frequenting the sleigh crossings on the Hudson; and smaller bands were numerous along the railroad upon the left bank. I encountered the first flock near Fishkill Landing, where they were feeding, on the sleigh track crossing the river. A number of them were brought down by the discharge of both barrels of my piece, and most of those left alighted upon the nearest trees on shore, but a few returned to their wounded companions, standing erect beside them, and uttering their loud call-note, as if entreating them to come away. They allowed me to come very near before they would forsake their unfortunate companions, and only left them when life was extinct, unless sooner driven away. When these had rejoined the flock upon the bank, the entire body proceeded northward. Subsequently, the species was common all along the Hudson. I did not molest them again, but took good care of the wounded ones, and afterward brought them safe home. They seemed starved, and ate greedily. Their wounds healed very quickly, and, in a few days, they were able to fly about. Soon they became very tame, and would come upon a table to be fed. They were released in the dining-room, where they spent most of the time among some house plants, at the windows; but, from their visits to the table during meals, they became a source of annoyance, and were shut up at those times. Towards spring they became restless, and struggled to get out of their cages, and, on being released, flew to the windows, pecked the glass, and uttered mournful cries.

Upon the railroad, a few flocks are commonly found spending the winter. These soon become begrimed, almost beyond recognition, by contact with the grease and dirt of the track; but they become very fat, for they are abundantly supplied with food,—the grain that

drops through chinks in the cars. Contrary to their usual habits, they are quite arboreal, spending most of the time upon trees, above the track, only descending occasionally to fill their crops, between the passage of trains. Among the mountains on the right bank of the river, I have rarely seen them. When shooting there on December 30, 1878, a flock of five flew overhead, uttering their wild notes, which seem to me to have a very wintry significance, which is quite in keeping with their white plumage and boreal habitat. They are said to occur occasionally at West Point.

The Snow Bunting breeds in the Arctic regions of Europe, Asia and America. A nest, with its complement of four eggs, taken at Akreyri, Iceland, June 13, 1874, was sent to me, together with a number of odd eggs, by Herr Alfred Benzon, of Copenhagen, and I take advantage of this opportunity to describe them. The nest is quite bulky; composed largely of dry grasses, with considerable long, fine, whitish hair interwoven and lining the inside; also a few feathers of some waterfowl, and some of those of its own species. It was built upon the ground, and still has some earth adhering to it. Its external diameter is about 6·00 inches, internal, nearly 3·00; depth, 2·40 externally, and 1·25 internally. The eggs belonging to this set, four in number, were all accidentally broken, but I have mended one of them perfectly, and the rest will answer for the purpose of description. They closely resemble each other in coloration; their ground-color is distinctly greenish-white, quite evenly marked with blotches of pale purplish-brown, and less numerous dashes of umber-brown; the spotting is a little more distinct at their larger ends. The mended egg measured ·88 by ·65 of an inch.

Seven eggs, taken at Akreyri, Iceland, in 1872, are now before me. Their ground-color varies from pale greenish to dirty white; some are so thickly covered with rusty-brown markings as almost to conceal the ground; others are sparsely or thickly spotted with dark umber-brown or sepia, sometimes aggregated at the larger end, sometimes arranged circularly about that extremity, and sometimes pretty uniformly distributed over the whole egg. They measure, respectively, ·94 × ·67; ·94 × ·68; ·90 × ·64; ·91 × ·63; ·85 × ·65; ·85 × ·66; ·88 × ·62.

*Dimensions.*— Average measurements of ten specimens: length, 6·88; stretch, 12·47; wing, 4·07; tail, 2·70; culmen, ·45; tarsus, ·83.

**76. Passerculus savanna** (*Wilson*). Savanna Sparrow. Common during spring and autumn; a few are seen during summer, but none in winter. It will probably prove to be a continuous resident; but of rare occurrence during the breeding season, and in winter. During migrations they are especially numerous upon the marshes. They make a whirring noise in flight, are not shy, and their note is a low *tweet.*

*Dimensions.*—Average measurements of nine specimens: length, 5·68; stretch, 9·10; wing, 2·62; tail, 2·09; culmen, ·43; gape, ·47; tarsus, ·80.

**77. Pocœcetes gramineus** (*Gmelin*). Bay-winged Sparrow. A summer resident; breeds. Arrives in March (30, 1878), and stays till November. It is found in old, weedy fields, and has a pretty little song in the spring.

*Dimensions.*—Average measurements of eleven specimens: length, 6·12; stretch, 10·35; wing, 3·06; tail, 2·38.

**78. Coturniculus passerinus** (*Wilson*). Yellow-winged Sparrow. A summer resident; breeds. Abundant in most parts of the Hudson Valley. In this vicinity there are few localities which suit its habits, and it is, consequently, rare. Mr. Wm. Church Osborn first apprised me of its occurrence, near Garrisons, in some high, sandy fields, where it breeds every summer. A female shot there, May 18, 1878, contained a full-sized ovum.

*Dimensions.*—Average measurements of three specimens: length, 5·38; stretch, 8·52: wing, 2·38; tail, 1·79; culmen, ·47; gape, ·51; tarsus, ·87; middle toe, ·57; its claw, ·15.

**79. Ammodramus caudacutus** (*Gmelin*). Sharp-tailed Finch. I have only found it during the month of October (16, 1874; 12, 1877), and at a single locality—on the salt marsh that joins Consook Island to the west shore. Mr. Wm. Church Osborn shot a fine male specimen, in the same place, on October 12, 1878.

*Dimensions.*—Average measurements of two specimens: length, 5·50; stretch, 7·50; wing, 2·24; tail, 2·00; culmen, ·46; gape, ·54; tarsus, ·87; middle toe and claw, ·80.

**80. Melospiza palustris** (*Wilson*). Swamp Sparrow. A summer resident; breeds. Arrives from the south in March, and stays till December. Occasionally seen in early winter. It will probably be found to be an occasional winter resident in the Highlands, as it is lower down the Hudson. It is found in swampy places inland, about the shores of ponds, and, most abundantly, on the salt marshes along the river. It builds its nest in a tussock of grass, and lays its eggs about the last of May (23, 1877). Its song is pretty, and differs from those of our other Sparrows. Mr. Francis Butterfass showed me an albinistic specimen that was about one-half white, which he shot at Cold Spring, on the Hudson.

*Dimensions.*—Average measurements of fourteen specimens: length, 5·89; stretch, 7 90; wing, 2·34; tail, 2·32; culmen, ·46; gape, ·49; tarsus, ·86; middle toe, ·61; middle toe and its claw, ·85.

**81. Melospiza fasciata** (*Wilson*). Song Sparrow. An abundant resident species; breeds. Always present throughout even the severest winters, in favorable situations; its abundance and disper-

sion depending on the character of the winter. But these hardy northerners depart in February, and are succeeded by the hosts of its species which make up the great northward migration, which begins late in February. It commences to build in April, and its first clutch of eggs is commonly deposited late in that month. The nest may be found in various situations—frequently attached to rushes in the marshes. On April 27, 1878, a pair of Song Sparrows were incubating their eggs, in an old nest of the Red-winged Blackbird (*Agelœus phœniceus*). In the same season, young were seen flying by May 18. It is not uncommon to find it sitting upon a late brood of eggs during the month of August. Prof. James M. DeGarmo has a nearly perfect albino, taken at Rhinebeck, on the Hudson.

*Dimensions.*—Average measurements of twenty-five specimens: length, 6·30; stretch, 8·57; wing, 2·52; tail, 2·62; culmen, ·49; tarsus, ·82; middle toe, ·67; middle toe and its claw, ·85.

**82. Junco hyemalis** (*Linné*). Eastern Snowbird. An abundant winter resident. Arrives in autumn about the end of September (30, 1874; October 12, 1875; September 28, 1876; October 18, 1879), and remains till May (1, 1873; 9, 1874; 8, 1875; 5, 1876; April 22, 1878; May 8, 1879; April 23, 1880). It breeds plentifully in the Catskill Mountains, and doubtless on the Shawangunk range in Orange County, N. Y. Mr. Wm. Church Osborn found it at Lake Mohonk, Ulster County, N. Y., in July, 1877. The Snowbird sings very sweetly before leaving us in the spring.

*Dimensions.*—Average measurements of twenty-four specimens: length, 6·27; stretch, 9·78; wing, 3·03; tail, 2·71; culmen, ·41; tarsus, ·81; middle toe and its claw, ·72.

**83. Spizella montana** (*Forster*). Tree Sparrow. A very abundant winter resident. Arrives from the North about the end of October (31, 1874; 30, 1876; November 7, 1877; October 26, 1878; November 17 [or earlier], 1879), and departs in April (29, 1874; 29, 1875; 29, 1876; 13, 1877; March 28, 1878; April 28, 1879; April 8, 1880). In the spring it has a very agreeable song, ending in a loud trill. Its food, in winter, consists largely of the seeds of alder and birch.

*Dimensions.*—Average measurements of twenty-eight specimens: length, 6·36; stretch, 9·46; wing, 2·99; tail, 2·82; culmen, ·41; gape, ·47; tarsus, ·80; middle toe, ·56; middle toe and its claw, ·76.

**84. Spizella socialis** (*Wilson*). Chipping Sparrow. A very abundant summer resident; breeds. Arrives from the South early in April (12, 1874 [2, F. S. Osborn]; 7, 1875; 17, 1876 [15, de Nottbeck]; 16, 1877; 3, 1878; 10, 1879; 5, 1880), and departs late in autumn (October 25, 1874; 29, 1876; 23, 1877; November 29, 1879). Begins to lay about the middle of May (16, 1872; 17, 1873; 12, 1877. Each nest contained its full complement of eggs).

The Chipping Sparrow, like the Marsh Wren (*Telmatodytes palustris*) and some other species, has the habit of waking up in the night and singing. This has also been noted by John Burroughs, C. Hart Merriam, and other writers. Another occurrence, to which attention has also been repeatedly called, is a singular accident to which this species appears to be especially liable, viz.: the frequency with which it meets a tragic end, in consequence of having accidentally become inextricably entangled in the long hairs with which it lines its nest. Three instances of the occurrence of this accident have come under my own observation. The last was shown me by Miss Anna B. Warner, of Constitution Island, in which case the bird was completely netted in the horsehair, which was wound about its wings in the most intricate manner. In the other cases the birds were found suspended from their nests by a single hair, which encircled their necks. In one case the male bird attracted my attention by its repeated cries of distress; and I found the female suspended in the manner indicated, in which condition it had evidently remained for a day or two, as it was very putrid.

*Dimensions.*—Average measurements of eleven specimens: length, 5·37; stretch, 8·73; wing, 2·74; tail, 2·29; culmen, ·36; tarsus, ·64.

**85. Spizella pusilla** (*Wilson*). Field Sparrow. An abundant summer resident, arriving in April (28, 1874; 21, 1875; 17, 1876; 26, 1879); begins to lay its eggs about the middle of May (16, 1876; 18, 1878). It has a very pleasant song.

*Dimensions.*—Average measurements of six specimens: length, 5·68; stretch, 8·14; wing, 2·50; tail, 2·55; culmen, ·40; gape, ·42; tarsus, ·74; middle toe, ·50; middle toe and its claw, ·65.

**86. Zonotrichia albicollis** (*Gmelin*). White-throated Sparrow. A very abundant spring and fall migrant, arriving, in spring, towards the last of April, and remaining till late in May (5, 1873; April 22 to May 16, 1874; April 30 to May 23, 1875; April 22 to May 28, 1876; April 2 to May 22, 1877; April 27 to May 18, 1878; April 23 to about May 30, 1879; April 14 to May 25, 1880). It reaches us, in autumn, towards the end of September (30, 1874; 23, 1876; 23, 1878), and stays till about the middle of November. Dr. A. K. Fisher saw it at Sing Sing, on the Hudson, on December 1, 1878. It is a regular winter resident in the Central Park, New York City. Mr. Eugene P. Bicknell says,[3] in an article read before the Linnæan Society of New York, and treating of some birds of Riverdale, on the Hudson: "A flock of white-throated sparrows (*Zonotrichia albicollis*), have been about the place all winter, coming to roost in the evening among some large spruce trees close to the house. A few others have

[3] "The Country," Vol. 1, No. 23, p. 324, March 30, 1878.

wintered here, but I have failed to find them except in the vicinity of private residences where an abundance of evergreens afford them a suitable shelter."

*Dimensions.*—Average measurements of eighteen specimens: length, 6·74; stretch, 9·46; wing, 2·89; tail, 2·86; culmen, ·50; gape, ·54; tarsus, ·90; middle toe, ·66; middle toe and its claw, ·88.

**87. Zonotrichia leucophrys** (*Forster*). White-crowned Sparrow. A rather rare spring and fall migrant. Observed from May 18 (1877) to 23 (1876). Mr. Thomas W. Wilson has taken specimens, at Cold Spring, on the Hudson, on October 12 and 16, 1875, and May 12, 1876.

*Dimensions.*—Average measurements of two adult females (Nos. 1,177 and 1,181, Highland Falls, N. Y., May 23, 1876, E. A. M.): length, 6·88; stretch, 9·82; wing, 3·03; tail, 2·88; culmen, ·50; tarsus, ·85; middle toe and its claw ·81.

**88. Passer domesticus** (*Linné*). European House Sparrow. *Introduced.* Resident; breeds. It is a pest, here, as everywhere. All intelligent landholders shoot it whenever it appears on their premises. The grape-growers are especially vindictive against it. My gardener complains that it destroys his green peas.

During winter, the English Sparrows frequent the marshes along the Hudson, in large flocks; but, in general, they make their homes in the towns, whence they sally forth to depredate in the country around; but to return to the protection of their city homes at the slightest alarm.

Mr. William Church Osborn furnishes the following interesting observation on its habits: "An adult male Yellow-bellied Woodpecker (*Sphyrapicus varius*) was taken dead, in a back yard on 36th-street, New York City. It was overcome, after a stout resistance, by the united attack of a number (twenty-two were counted that engaged in the affair) of English Sparrows, one of their number having been left dead upon the field along with the luckless Woodpecker."

*Dimensions.*—Average measurements of fifteen specimens: length, 6·33; stretch, 9·72; wing, 3·01; tail, 2·30; culmen, ·50; gape, ·60; tarsus, ·76; middle toe, ·63; its claw, ·21.

**89. Passerella iliaca** (*Merrem*). Fox Sparrow. An abundant spring and fall migrant. In spring, arrives early in March, and stays till about the middle of April (March, 25, 1871; 21, 1873; 5 to April 30, 1874; 16 to April 28, 1875; 6 to April 14, 1876; 23 to April 2, 1877; February 28 to April 4, 1878; March 12 to April 10, 1879; March 6 to April 8, 1880). In autumn, arrives towards the end of October, and stays till about the first of December (October 22 to November 25, 1874; October 28, 1876; November 9 to December 8, 1877; October 26, 1878; October 26 to November 30, 1879).

This handsome species is the largest of our Sparrows, and the first

strictly migratory species to appear in spring. It begins to sing soon after its arrival. Its notes are full and rich; and, when singing, it is apt to be perched on a tree-top, although it frequently sings in a brush-heap. Its ordinary note is a low *tweet*, sometimes modulated so as to resemble the Cedar-bird's note; and it also gives a sharp, metallic utterance like the Brown Thrasher's (*Harporhynchus rufus*). Its flight is accompanied by a loud whirring sound.

*Dimensions.*—Average measurements of twenty-three specimens: length, 7·26; stretch, 11·14: wing, 3·39; tail, 2·85; culmen, ·50; gape, ·57; tarsus, ·96; middle toe, ·64; its claw, ·31.

**90. Zamelodia ludoviciana** (*Linné*). Rose-breasted Grosbeak. A summer resident; breeds. Most abundant during its migrations. Arrives early in May (13, 1873; 9, 1874; 13, 1875; 11, 1876; 16, 1877; 9, 1878; 10, 1879; 4, 1880), and stays through September (21, 1874).

This lovely bird is found in the open woods; but it also resorts to fields and orchards in the springtime. Its black-and-white colors remind one strongly of the Bobolink; but, besides, its folded wing conceals the rose-colored lining in the male, and yellow in his plainer-clad mate; and,—most conspicuous,—a patch of brightest carmine adorns the breast of the male. The Rose-breasted Grosbeak destroys the fruit-blossoms in the orchards, being especially fond of those of the cherry; and I suppose that it really does some damage to the crops; this, to my mind, however, it more than compensates for, by adding so much brightness and melody to the happiest of seasons. But it has another bad habit: where fields, newly sown with the cereal grains, are convenient to its woodland retreats—for it is a shy bird — its species will collect in large flocks, and resort there continually, as long as there is a grain of seed to be had.

*Dimensions.*—Average measurements of sixteen specimens:—length, 8·12; stretch, 12·92; wing, 4·02; tail, 2·99; culmen, ·69; gape, ·76; tarsus, ·88; middle toe, ·64; its claw, ·27; middle toe and its claw, ·83.

**91. Passerina cyanea** (*Linné*). Indigo Bird. A common summer resident; breeds abundantly. Arrives early in May (10, 1872; 13, 1873; 12, 1874; 12, 1875; 20, 1876; 14, 1877; 4, 1878; 15, 1879; 7, 1880), and departs in September (20, 1876; 19, 1879).

These pretty birds are common in neglected fields, and in the edge of the woods. I have known them to dwell, and rear their young, in the densest swamps of the wilderness, but this is quite exceptional, and they are rarely seen away from civilized parts. Their nests are built in bushes — commonly in blackberries growing along fences, or even in gardens of cultivated raspberries. Their song is very clear and fine. They pillage the grain-fields in company with the Purple Finch and Rose-breasted Grosbeaks. In autumn, associated in im-

mense flocks, they are seen feeding with the Blackbirds and Reedbirds upon the salt marshes along the Hudson, when it is interesting to observe the various transitional phases of their plumage, so well exhibited by an abundance of differing individuals.

*Dimensions.*—Average measurements of sixteen specimens: length, 5·59; stretch, 8·52; wing, 2·58; tail, 2·11; culmen, ·41; gape, ·45; tarsus, ·67; middle toe, ·49; its claw, ·19.

**92. Cardinalis virginianus** (*Brisson*). Cardinal Grosbeak; Virginia Redbird. A bird flew close past me down a ravine in the woods, on May 11, 1876. It uttered a note which I distinctly remember; it must have been a Cardinal Grosbeak, though I was not then certain about its identity, thinking it might be the Summer Tanager (*Pyranga æstiva*).

**93. Pipilo erythrophthalmus** (*Linné*). Ground Robin; Marsh Robin; Towhee Bunting; Chewink. An abundant summer resident; breeds. Arrives the last of April (27, 1872; May 8, 1873; May 7, 1874; April 30, 1875; April 25, 1876; May 5, 1877; April 26, 1878; April 27, 1879; April 28, 1880), and stays till late in autumn (October 15, 1874; 11, 1875, Wilson, at Cold Spring; 25, 1876 [one that had been disabled was captured on the 28th]).

*Dimensions.*— Average measurements of seventeen specimens:— length, 8·35; stretch, 11·14; wing, 3·34; tail, 3·68; culmen, ·55; gape, ·71; tarsus, 1·09; middle toe, ·73; its claw, ·30; middle toe and its claw, 1.00.

## Family, ICTERIDÆ.

**94. Dolichonyx oryzivorus** (*Linné*). Bobolink; Reed-bird; Rice-bird. A summer resident; breeds. Arrives early in May (12, 1873; 21, 1875; 23, 1876; 22, 1877; 5, 1878), and stays till about the end of September (10, 1874; 22, 1876; 18, 1879). Not a very abundant summer resident; but occurs in large flocks during August and September, feeding upon the salt marshes along the Hudson.

*Dimensions.*—Average measurements of eight males:—length, 7·55; stretch, 11·95; wing, 3·76; tail, 2·73; culmen, ·60; tarsus, 1·10; middle toe and its claw, 1·06. Female:—length, 7·15; stretch, 11·25; wing, 3·54; tail, 2·53; culmen, ·58; gape, ·61; tarsus, 1·07.

**95. Molothrus ater** (*Gmelin*). Cow-bird; Cow-Blackbird. A common summer resident; breeds abundantly. Arrives about the first of April (29, 1873; 18, 1874 [Frederic S. Osborn, at Garrisons]; 29, 1875; 17, 1876; 13, 1877; March 30, 1878; April 5, 1879; April 10, 1880), and disappears in August.

On Long Island, and in the vicinity of New York, Cow-birds spend the winter; but they have not been seen in the Highlands at that season. Mr. Jas. S. Buchanan took a perfect albino, at Newburgh,

on the Hudson. Cow-Blackbirds come to us in abundance early in April, and may then be seen running swiftly and gracefully about,—not hopping,—and picking up seeds in newly-planted fields. They are reproductive parasites, as well as polygamists. One of their eggs was hatched by the European House Sparrows, in Highland Falls, N. Y.; the young Cow-bird thrived, and remained with the Sparrows in the town for some time, and it was a common sight to see them feeding it in the street. Their amours are conducted in an amusing manner. The sexes associate indiscriminately, and in varying proportions. The males, in green-black and chocolate-brown dress, commence the performance by walking about with their necks arched, and decurved, so that their bills nearly touch the ground; then a male approaches one of the females, — which are considerably smaller, and brownish in color,— running at full speed, and, when close to her, pitches forward till his bill nearly touches the ground: this as if in salutation. The different males repeat this movement, and the more ardent ones ruff up all their feathers, and drag their expanded tails upon the ground, as they strut up to the side of their favorites, with skins inflated to an indefinite and alarming extent by the amorous passions within; meanwhile they utter various uncouth guttural noises, some of which resemble the loud, "cork-drawing" notes of the *Corvidæ*, while others are precisely like the sounds produced by tilting a partly empty cask. The females pay little attention, fill their crops, and utter an occasional note resembling that of the Cedar-bird (*Ampelis cedrorum*).

*Dimensions.* — Average measurements of eleven males: length, 7·92; stretch, 13·57; wing, 4·24; tail, 3·01; culmen, ·67; gape, ·68; tarsus, 1·02; middle toe, ·72; middle toe and its claw, ·94; claw alone, ·25. Average measurements of five females: length, 7·18; stretch, 12·22; wing, 3·84; tail, 2·68; culmen, ·61; gape, ·63; tarsus, ·94; middle toe, ·64; middle toe and its claw, ·94; claw alone, ·26.

**96. Agelæus phœniceus** (*Linné*). Red-winged Blackbird; Marsh Blackbird. A common summer resident; breeds. Arrives about the beginning of March (first seen March 25, 1871; April 2, 1872; March 31, 1873; April 25, 1874; March 18, 1875; 6, 1876, Thomas W. Wilson; April 7, 1877; March 27, 1878; 29, 1879; 28, 1880), and departs before December (last seen November 17, 1877).

*Dimensions.* — Average measurements of twenty-two males; length, 9·51; stretch, 15·23; wing, 4·72; tail, 3·77; culmen, ·93, gape, ·97; tarsus, 1·11; middle toe, ·77; middle toe and its claw, 1·05. Average measurements of eight females: length, 7·74; stretch, 12·56; wing, 3·92; tail, 3·01; culmen, ·74; tarsus, 1·01.

**97. Sturnella magna** (*Linné*). Meadow-lark; Field-lark. A resident species; but only occasional, and never abundant, in win-

ter; breeds in favorable situations. The migrants arrive, or pass through, in March (April 10, 1873; 2, 1877; March 30, 1878; April 5, 1879; April 6, 1880).

*Dimensions.* — Average measurements of four males: length, 10·75; stretch, 16·53; wing, 4·76; tail, 3·16; culmen, 1·35; gape, 1·45; tarsus, 1·72; middle toe, 1·15; middle toe and its claw, 1·53; claw alone, ·35. Female: length, 9·57; stretch, 14·86; wing, 4·22; tail, 2·75; culmen, 1·30; gape, 1·35; tarsus, 1·60; middle toe, 1·17; its claw, ·40.

**98. Icterus spurius** (*Linné*). Orchard Oriole. A common summer resident; breeds. Arrives early in May (9, 1872; 19, 1873; 13, 1874; 9, 1875; 7, 1876 [5, de Nottbeck, at Fishkill]; 15, 1877; 12, 1878; 8, 1879; 3, 1880), and remains till late in September (17, 1874).

*Dimensions.* — Average measurements of eleven males: length, 7·32; stretch, 10 34; wing, 3·18; tail, 2·92; culmen, ·65; gape, 74; tarsus, ·88; middle toe, ·58; its claw, ·26.

**99. Icterus galbula** (*Linné*, 1758). Baltimore Oriole. An abundant summer resident; breeds plentifully. Arrives early in May (9, 1872; 11, 1873; 9, 1874; 9, 1875; 7, 1876; 13, 1877; 3, 1878; 6, 1879; 2, 1880), and departs early in September (22, 1874.) In a nest of unusually large size, found in a pear-tree near my house by Louis A. Zerega, in June, 1874, there were no less than eight eggs.

*Dimensions.*—Average measurements of twenty-three specimens: length, 7·53; stretch, 11·72; wing, 3·52; tail, 2·84; culmen, ·70; tarsus, ·85.

**100. Scolecophagus ferrugineus** (*Gmelin*). Rusty Grackle. A common spring and fall migrant. Arrives from the South early in March (30, 1873; 19, 1874; 17, 1875; 14, 1876; April 5, 1879; March 11, 1880), and all pass through before the end of May. Returning in autumn, they are found from September until December.

*Dimensions.*—Average measurements of ten specimens: length, 9·55; stretch, 14·60; wing, 4·61; tail, 3·52; culmen, ·91; tarsus, 1·06; middle toe and its claw, ·75.

**101. Quiscalus purpureus** (*Linné*). Purple Grackle; Crow Blackbird. A spring and fall migrant. I do not know that any breed *in* the Highlands; but numbers do so about Newburgh, and Fishkill-on-the-Hudson, just above the Highlands; and the species nests plentifully lower down the river. It arrives in March (11, 1871; 6, 1874; February 29, 1877, Fishkill, de Nottbeck; March 8, 1878; 12, 1879). In autumn, it remains till November.

In the mountains, Crow Blackbirds are quite uncommon, although they are abundant on both sides of us. In Orange County, I have observed them in the greatest numbers. On the first of May last, I took the stage at Newburgh, for Cornwall. The bridge at Moodna Creek was being repaired, so the coach proceeded *via* Vail's Gate.

On the way, were seen large numbers of Grackles, of varieties *purpureus et æneus*. The stage was a horribly rickety, old rattletrap, which still bore some slight vestiges of the conventional yellow color with which it had originally been decorated; on its top were piled some long, crooked, heavy iron rods, which rattled dangerously overhead. This splendid vehicle was drawn by two lean and ghostly horses, whose best days were passed a decade or more ago; as the driver whipped them up the long hills, I could not help feeling that I was doing violence to my humanity by sitting on the driver's seat instead of getting out and helping the horses pull, as my conscience told me I ought to be doing. The roads and fences were lined with sturdy, old cedars, and, in these, the grackles were ensconced. As we drove past, almost brushing the branches, they hopped down close to us, leered at our bony nags, peered into the coach and screamed derisively at us, and spread their tails in high glee as they called to their neighbors in advance to join in the merriment at our expense, and they in turn jeered us as we passed by. I could not help feeling ashamed, and, involuntarily, turned to see if our red-nosed driver shared my emotions. The Crow Blackbirds were scattered over the fields on both sides of the road. The bronzed variety shone like gold in the sunlight, while the purple ones glittered brilliantly in their metallic plumage.

I have never known them to breed in the mountains; but in all the low-lying meadow-country along the Hudson, they do so abundantly —especially where coniferous trees abound.

*Dimensions.*— Average measurements of adult male: length, 12·50; stretch, 17·75; wing, 5·55; tail, 5·40; culmen, 1·17; gape, 1·35; tarsus, 1·45; middle toe, 1·00; its claw, ·34.

Regular Meeting, Monday, April 5, 1880.

Meeting this evening. The President in the chair. Records read. Donations and correspondence announced.

Rev. George H. Hosmer, of Salem, and Rev. E. C. Butler, of Beverly, were duly elected members.

*Voted*, That the thanks of the Institute be tendered to Hon. George B. Loring for courtesies and civilities extended to members of the Institute and their friends, during the recent visit to Washington, D. C.

Prof. Edward S. Morse made a communication on the persistence of Korean art in Japanese pottery. His remarks were illustrated by numerous examples of Korean and Japanese ware. One very conspicuous character of Korean pottery of three hundred years ago was the inlaying of the ornamentation in white or black upon a gray ground. The design being first cut out in delicate lines or large areas in the case of leaves, or else impressed by means of a stamp. These depressed portions were then filled in with either white or black pigments. He showed that wherever the Korean potters had settled in Japan as in Satsuma, Higo, Hizen, Suwo, and other places, the pottery still bears the impress of this peculiar method of ornamentation.

Regular Meeting, Monday, April 19, 1880.

Meeting this evening. The President in the chair. Records read. Donations and correspondence announced.

Hon. Nathan Crosby, of Lowell, read an interesting and valuable paper entitled "Essex County and Essex County Men."

The paper is printed in the Historical Collections of the Essex Institute, Vol. XVII, April, 1880.

Regular Meeting, Monday, May 3, 1880.

Meeting this evening. The President in the chair. Records read. Donations and correspondence announced.

William D. Dennis, of Salem, was elected a resident member.

R. A. Brock, of Richmond, Va., was duly elected a corresponding member.

Messrs. James Kimball, T. F. Hunt, and H. W. Putnam, were appointed a committee to nominate a list of officers to be balloted for at the Annual Meeting.

A vote of thanks was passed to Hon. Nathan Crosby, for his paper on "Essex County and Essex County Men," read by him at a recent meeting of the Institute.

The Secretary was instructed to ask Judge Crosby for a copy of the paper for publication.

Mr. Hunt stated that the "Roundabout Club," of Melrose, proposed to visit Salem on the 17th of June next, and on the motion of the same gentleman, the President and Secretary were made a committee to extend the civilities of the Institute to the club.

*Voted*, To hold the "Winthrop" Field Meeting on the 22d of June next.

ANNUAL MEETING, MONDAY, MAY 17, 1880.

THE ANNUAL MEETING, this evening at 7.30 o'clock. The PRESIDENT in the chair. Records of last Annual Meeting read.

The reports of Secretary, Treasurer, Auditor, Librarian, and the Curators and Committees were read and duly accepted, and ordered to be placed on file.

Rev. George W. Gardner, of Marblehead, was elected a member.

The Committee appointed at the previous meeting to nominate a list of officers for the ensuing year reported the following:

PRESIDENT:

HENRY WHEATLAND.

VICE-PRESIDENTS:

ABNER C. GOODELL, JR., WILLIAM SUTTON,
FREDERICK W. PUTNAM, DANIEL B. HAGAR.

SECRETARY: TREASURER:

GEORGE M. WHIPPLE. GEORGE D. PHIPPEN.

AUDITOR: LIBRARIAN:

RICHARD C. MANNING. WILLIAM P. UPHAM.

CURATORS:

*History*—JAMES KIMBALL.
*Manuscripts*—WILLIAM P. UPHAM.
*Archæology*—FREDERICK W. PUTNAM.
*Numismatics*—MATTHEW A. STICKNEY.
*Geology*—ISAAC J. OSBUN.
*Botany*—GEORGE D. PHIPPEN.
*Zoology*—EDWARD S. MORSE.
*Horticulture*—HENRY W. PUTNAM.
*Music*—JOSHUA PHIPPEN, JR.
*Painting & Sculpture*—T. F. HUNT.
*Technology*—EDWIN C. BOLLES.

COMMITTEES:

*Finance:*

The PRESIDENT, *Chairman ex off.*

JAS. KIMBALL. JAS. O. SAFFORD. HENRY M. BROOKS. GEO. R. EMMERTON.

The TREASURER, *ex off.*

*Library:*

CHARLES W. PALFRAY. GEORGE F. FLINT. HENRY F. KING.

WILLIAM NEILSON. WILLIAM D. NORTHEND.

The LIBRARIAN, *ex off.*

*Publication:*

EDWARD S. ATWOOD. ABNER C. GOODELL, JR. EDWIN C. BOLLES.

JAMES KIMBALL. T. F. HUNT.

JAMES A. EMMERTON.

*Lecture:*

FREDERICK W. PUTNAM. AMOS H. JOHNSON. ARTHUR L. HUNTINGTON.

FIELDER ISRAEL. ROBERT S. RANTOUL.

*Field Meeting:*

The SECRETARY, *Chairman ex off.*

GEORGE A. PERKINS, Salem. GEORGE D. PHIPPEN, Salem.
GEORGE COGSWELL, Bradford. JAMES H. EMERTON, Salem.
FRANCIS H. APPLETON, Peabody. EBEN N. WALTON, Salem.
NATHANIEL A. HORTON, Salem. WINFIELD S. NEVINS, Salem.

EDWARD S. MORSE, Salem.

The PRESIDENT appointed Messrs. Caleb Cooke and William Neilson to receive and count the ballots. These gentlemen attended to their duty, and reported that nineteen ballots were thrown all for the persons above stated, and the ticket as nominated was declared elected.

VICE PRESIDENT F. W. PUTNAM referred to the coming Winthrop Field Meeting and read a humorous paper, written by Mr. Horace Scudder and read by him at a late club dinner. It was entitled "A Memorial Supper on the death of the Memorable and truly Honorable John Winthrop, Esq."

compiled from the several reports read at the meeting, presents the work of the Institute in the various departments since the last annual meeting.

MEMBERS.—Changes occur in the list of our associates by the addition of new names, and the withdrawal of some by resignation, removal from the county or vicinity, or by death. Eleven resident members have died, and we have received information of the decease of three of our correspondents.

*Alfred Peabody*, son of Nathan and Hannah (Stickney) Peabody, born Feb. 3, 1806; merchant; died at Salem, June 13, 1879, aged 73 yrs., 4 mos., 10 days. Elected a member March 26, 1851.

*Edward Fitzgerald*, physician in Salem; born in Ireland Jan. 1, 1826; son of Richard and Johannah (Fitzgerald) Fitzgerald; died July 7, 1879. Elected a member March 30, 1859.

*Thomas M. Saunders.* In early life a captain and supercargo in the East India trade; a merchant; son of Daniel and Sarah (Gill) Saunders, born June 10, 1795; died Aug. 19, 1879. Elected a member July 6, 1864.

*Joseph A. Goldthwaite*, son of Ezekiel and Mary (Fuller) Goldthwaite; born at Salem, Aug. 25, 1813; a cooper, in early life; at the time of his decease, superintendent of the Old Men's Home, Salem; died Sept. 2, 1879, aged 66 years. Elected a member May 8, 1857.

*Henry L. Williams;* merchant and an ex-mayor of Salem; son of Israel and Lydia (Waite) Williams, born at Salem, July 23, 1817; died Sept. 27, 1879. Elected a member Sept. 16, 1867.

*Benjamin F. Mudge*, son of James and Ruth (Atwell)

Mudge, of Lynn; born in Orrington, Me., Aug. 11, 1817; graduated at Wesleyan Univ., 1840; a lawyer, and mayor of Lynn in 1852; removed to Kansas in 1861—State Geologist and Professor of Natural History in State Agric. College; died at Manhattan, Kans., Nov. 21, 1879. Elected a member April 23, 1856.

*Nathaniel Brown*, son of Nathaniel and Elizabeth (Millett) Brown, of Salem; sea captain and merchant, mayor of Salem; born March 19, 1827; died Dec. 10, 1879, aged 52 yrs., 8 mos., 22 days. Elected a member July 6, 1864.

*Charles Lawrence*, son of Abel and Abigail (Page) Lawrence, born at Salem, Oct. 7, 1795, graduated at Harv. Univ. 1815; in early life went several voyages to India, in later life retired on a farm in Danvers; died in Danvers, Dec. 21, 1879, aged 84. Original member.

*Josiah Newhall*, son of Jacob and Ede (Marble) Newhall, of Lynnfield, born in Lynnfield, June 6, 1794. In early life a teacher, afterwards a farmer and horticulturist; died in Lynnfield, Dec. 26, 1879. Elected a member Feb. 13, 1867.

*Thomas Mayo Brewer*, son of Thomas Brewer, born Nov. 21, 1814, in Boston, graduated at Harv. Univ., 1835; a physician, afterwards an editor and publisher, distinguished as an ornithologist; died in Boston, Jan. 23, 1880, aged 65 years. Elected a corresponding member Oct. 26, 1859.

*Richard Frothingham*, son of Richard and Mary (Thompson) Frothingham, born in Charlestown, Mass., Jan. 31, 1812, and was devoted during all his life to literary pursuits; author of "History of Charlestown," "History of the Siege of Boston," "Life of Gen. Joseph Warren," etc., many years co-editor of the Boston Post, ex-mayor of Charlestown; died at Charlestown, Jan. 30, 1880.

*Benjamin Hodges Silsbee*, son of William and Mary (Hodges) Silsbee; born at Salem, October 10, 1811; graduated at Harv. Univ., 1831; merchant; died Feb. 22, 1880. An original member.

*Lewis N. Tappan*, son of Eben and Sallie (Hooper) Tappan, born in Manchester, engaged in Mining operations, winters spent in Boston, summers in Manchester; died in Leadville, Colorado, Feb. 25, 1880. Elected a member Oct. 5, 1874.

*William Dean Waters*, son of Joseph and Mary (Dean) Waters, born at Salem, Nov. 30, 1798; merchant; died at Salem, April 20, 1880.

Field Meetings.—Four during the summer. *First*, near Ship Rock, South Peabody, on Friday, June 20, 1879, the afternoon session was held in the chapel near by. Rev. George F. Wright, of Andover, spoke of the geology of that vicinity, Messrs. James H. Emerton and G. A. Perkins, of Salem, on the plants collected, Rev. C. C. Carpenter and Samuel Brown, of South Peabody, Rev. Messrs. Israel and Hosmer, of Salem, and the chairman, on historical and general subjects. *Second*, at Andover, Friday, June 27, 1879. The various places of historical or scientific interest were visited during the forenoon, under the direction of Rev. George F. Wright, of that place. The afternoon session was held in the Free Congregational Church. The speakers were Rev. George F. Wright, Prof. William H. Niles, Rev. Francis H. Johnson, Prof. Goldsmith, principal of the Punchard High School, Mr. J. H. Emerton, Rev. Selah Merrill, and Rev. E. S. Atwood. *Third*, at the Asylum Station in Danvers, Thursday, July 31, 1879. The afternoon session was held in Hathorne Hall, in the Asylum Building. Dr. May, the superintendent, gave a description of the building, method of heating, ventilation, etc. The President and

Mr. Andrew Nichols alluded to the historical associations of this locality. Rev. L. M. Livermore, Mr. J. H. Emerton, Dr. George A. Perkins, Rev. Fielder Israel, Rev. Mr. Wright, of Danvers, made appropriate remarks. *Fourth*, at Bay View, Gloucester, the seaside residence of Col. J. H. French, by whose invitation a very pleasant meeting was held, Wednesday, Aug. 27, 1879. The Cape Ann Literary and Scientific Society united with the Institute on this occasion. Col. French, Dr. Conant, President of the Cape Ann L. and S. Society, Judge Davis, Mr. J. H. Emerton, Judge Drake, of the Court of Claims, Washington, D. C.; Prof. A. Hyatt, Dr. Davis, and Mr. N. A. Horton were among the speakers.

Excursions.—Three excursions. *First*, a summer excursion, embracing the following interesting points: Saratoga Springs, Watkins Glen, Seneca Lake, Niagara Falls, River St. Lawrence and Thousand Isles, Montreal and Lake Memphremagog, left Salem, Tuesday, July 15, 1879, and returned on Thursday, July 24. *Second*, the autumnal excursion during the first week in September, leaving Salem, Tuesday, Sept. 2, 1879, for Saratoga, Lake George, Ticonderoga, Lake Champlain, Montpelier, Vt., and the Franconia mountains, returning on Saturday, Sept. 6. *Third*, to Washington, D. C., and Richmond, Va., leaving Salem on Thursday, March 18, 1880, and returning Saturday, March 27, with a side trip to Mount Vernon and sufficient time to notice many objects of interest in the two cities.

Lectures.—A course of eight Geographical lectures under the direction of the Lecture Committee, was as follows: *1st*, Monday, Sept. 29, 1879, Rev. E. S. Atwood,

"Palestine." *2d*, Monday, Oct. 13, 1879, Rev. George T. Flanders, "Spain, Morocco and Algiers." *3d*, Monday, Oct. 27, 1879, Frederick E. Ober, "Lesser Antilles." *4th*, Monday, Nov. 10, 1879, S. G. W. Benjamin, "Portugal." *5th*, Monday, Dec. 1, 1879, Rev. E. C. Bolles, "England." *6th*, Monday, Dec. 22, 1879, E. S. Morse, "Japan." *7th*, Monday, Jan. 5, 1880, Thomas Davidson, "Athens." *8th*, Monday, Jan. 12, 1880, Rev. A. P. Peabody, "Russia." These lectures were carefully prepared and most of them were illustrated by lantern views, and were instructive.

In addition to the above, three courses of lectures, and one of readings of six each—free to the public—were given; the only condition was that persons desiring to attend should apply for tickets at the rooms of the Institute. The results have been most gratifying. The class of people for whom these lectures were intended has been reached, and the hall has been filled with quiet, appreciative, and attentive audiences.

*1st*, six lectures by L. E. Beckwith, "*The Lives and Writings of the Prose Authors of the Age of Queen Anne*," on Thursday afternoons, beginning Nov. 6, 1879; *2nd*, six lectures by Charles Sedgwick Minot, upon "*Comparative Embryology*," on Tuesday afternoons, commencing Jan. 6, 1880; *3d*, six lectures by Ephraim Emerton, "*The Beginnings of Modern Life*," on Wednesday afternoons, commencing March 3, 1880; Prof. Henry Klein, *French and German Readings*, on Monday afternoons, commencing Monday, Feb. 16, 1880.

In addition to the above we may include the three lectures on "*Old England*," by Rev. E. C. Bolles, on Wednesdays, March 24, 31, and April 7, 1880, and a lecture by Rev. C. T. Brooks, on the "*Roman Cam-*

*pagna*," on Monday, March 8, 1880. These were not under the direction of the Institute.

MEETINGS.—*Regular Meetings* usually on the first and third Monday evenings of each month. The following communications received and lectures delivered may be specified: Mr. *James Samuelson*, of Liverpool, on "Darwinism" and on "The Classification of Animals;" *William H. Tappan*, of Manchester, "Gold and Silver Mines and Miners," the results of his experience in California, Nevada, and Colorado; *James H. Emerton*, "Animals living at the bottom of Salem Harbor," the results of dredging during the summer of 1879; *W. S. Nevins*, "Mount Vesuvius and the ruins of Pompeii;" *D. B. Hagar*, "Spelling Reform;" *F. W. Putnam*, "The former Indians of Southern California, bearing on the origin of the Red Man in America;" *E. S. Morse*, "The influence of Early Korean Art upon Japanese Pottery;" Rev. *Edward Collyer*, of New York, "An Episode in the life of Edward Fairfax;" *Thomas H. Walker*, of Pottsville, Pa., "On Prison Discipline;" *Nathan Crosby*, of Lowell, "Essex County and Essex County Men;" Rev. *Robert C. Mills*, "Memoir of James Upton;" *James Kimball*, "On the Early manufacture of Glass in Salem," "Notes on the Richardson and Russell Families;" *Henry F. Waters*, "The Gedney and Clarke Families, of Salem, Mass.;" *William P. Upham*, "Records of the First Church at Salisbury, Mass., 1687–1754."

CONCERTS.—Under the personal direction of the curator of music five concerts have been given, with much credit to the society as musical performances. The eleventh season.

*1st*, Monday, Nov. 3, 1879, Mrs. G. C. Adams, Miss

Ita Welsh, Mr. W. E. G. Evans and Dr. E. C. Bullard, under the direction of Mr. J. Phippen, jr., curator of music. *2nd*, Monday, Dec. 8, 1879, Mr. W. H. Sherwood, pianist, M'me Luisa Cappiani, soprano, Miss Julia A. Wells, contralto, and Dr. Albion M. Dudley, tenor. *3d*, Monday, Feb. 2, 1880, by Miss Fannie Lovering, soprano, Mr. Bernhard Listemann, violin, Mr. Alex. Heindl, violoncello, Mr. J. Phippen, jr., piano-forte. *4th*, Monday, Feb. 23, 1880, Piano-forte Recital by Mr. John A. Preston, assisted by Miss Sara W. Barton, soprano. *5th*, an operetta, "The Crimson Scarf," Friday, April 9, 1880.

Mr. Joshua Phippen, jr., the Curator, gave in October three piano-forte recitals; these were quite successful and drew together cultivated audiences.

Library.— The additions to the Library for the year May, 1879–May, 1880, have been as follows:—

*By Donation.*

| | |
|---|---|
| Folios | 27 |
| Quartos | 94 |
| Octavos | 483 |
| Duodecimos | 415 |
| Sexdecimos | 301 |
| Octodecimos | 52 |
| Total of bound volumes | 1,372 |
| Pamphlets and Serials | 6,494 |
| Total of Donations | 7,866 |

*By Exchange.*

| | |
|---|---|
| Quartos | 10 |
| Octavos | 102 |
| Duodecimos | 10 |
| Sexdecimos | 2 |
| Octodecimos | 2 |
| Total of bound volumes | 126 |
| Pamphlets and Serials | 1,881 |
| Total of Exchanges | 2,007 |

*By Purchase.*

| | |
|---|---|
| Quartos | 1 |
| Octavos | 66 |
| Duodecimos | 50 |
| Sexdecimos | 23 |
| Total of bound volumes | 140 |
| Pamphlets | 32 |
| Total of Purchases | 172 |
| Total of Donations | 7,866 |
| Total of Exchanges | 2,007 |
| Total by Purchase | 172 |
| Total of Additions | 10,045 |

Of the total number of pamphlets and serials, 4,090 were pamphlets, and 4,317 were serials.

The donations to the Library for the year have been received from one hundred and eighty-six individuals and twenty-seven societies and departments of the General and State Governments. The exchanges from seven individuals, one hundred and forty-four societies and incorporate institutions, of which ninety-one are foreign; also from editors and publishers.

Donations or exchanges have been received from the following: —

| | Vols. | Pam. |
|---|---|---|
| Abbot, Francis E., Boston, Mass., | 3 | |
| Adams, H. B., Baltimore, Md., | | 6 |
| Adelaide, Philosophical Society, | | 1 |
| Albany, N. Y. State Library, | 4 | 8 |
| Alnwick, Berwickshire Naturalists' Field Club, | | 1 |
| American Association Advancement of Science, | 1 | |
| American Social Science Association, | | 1 |
| Anagnos, M., Boston, Mass., | | 1 |
| Andrews, Mrs. James H., | | 1 |
| Andrews, Wm. P., | | 44 |
| Anthony, J. G., Estate of the late, | 29 | 217 |
| Appleton, Wm. Sumner, | 1 | |
| Archer, Geo. B., Brooklyn, N. Y., | | 1 |
| Augsburg, Naturhistorischer Verein, | | 1 |
| Baetz, Henry, Milwaukee, Wis., | | 1 |
| Baltimore, Maryland Historical Society, | | 2 |

| | Vols. | Pam |
|---|---|---|
| Baltimore, Md., Peabody Institute, | | 1 |
| Bancroft, Cecil F. P., Andover, Mass., | | 2 |
| Barton, Wm. G., | | 5 |
| Batavia, Bataviaasch Genootschap van Kunsten en Wetenschappen, | 1 | 13 |
| Batavia, Natuurkundige Vereeniging in Nederlandsch India | | 1 |
| Beedham, B., | 1 | |
| Belfast, Naturalists' Field Club, | | 1 |
| Bemis, Luke, West Chester, Penn., Newspapers, | | |
| Bergen, Bergenske Museum, | 1 | |
| Berlin, Gesellschaft Naturforschender Freunde, | | 1 |
| Berlin, Verein zur Beförderung des Gartenbaues, | | 24 |
| Bolles, Rev. E. C., Newspapers, | 11 | 123 |
| Bologna, Accademia delle Scienze, | | 1 |
| Bonn, Naturhistorischer Verein der preussischen Rheinlande, und Westphalens, | 4 | 2 |
| Bordeaux, Académie des Sciences, Belles-Lettres et Arts, | 5 | |
| Bordeaux, Société Linnéenne, | | 6 |
| Boston, American Academy of Arts and Sciences, | 1 | 1 |
| Boston, City of, | 3 | |
| Boston, Mass. Historical Society, | 2 | |
| Boston, Mass. Horticultural Society, | | 2 |
| Boston, Mass. Institute of Technology | | 1 |
| Boston, Mass. Medical Society | | 1 |
| Boston, N. E. Historic and Genealogical Society, | 1 | 5 |
| Boston, Public Library, | | 16 |
| Boston, Scientific Society, | | 6 |
| Boston, Society of Natural History, | 1 | 15 |
| Boston, Society of Medical Improvement, | 1 | |
| Boynton, Herbert W., Boston, Mass., | 7 | 16 |
| Bradlee, Rev. C. D., | | 1 |
| Braunschweig, Archiv für Anthropologie | 1 | 3 |
| Bremen, Naturwissenschaftlicher Verein, | | 1 |
| Briggs, Miss M. E., Charts, Maps, | 92 | 20 |
| Bristol, Naturalists' Society, | | 2 |
| Brock, R. A., Richmond, Va., Newspapers, | 5 | 9 |
| Brooks, Henry M., | 6 | 4 |
| Brooks, W. K., Baltimore, Md., | | 1 |
| Brown, Horace, | 23 | 37 |
| Brunn, Naturforschender Verein, | | 3 |
| Bruxelles, L'Académie Royale des Sciences des Lettres, des Beaux Arts de Belgique, | 6 | |

| | Vols. | Pam. |
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| Bruxelles, Société Belge de Microscopie, | 1 | 12 |
| Bruxelles, Société Entomologique de Belgique, | | 12 |
| Bruxelles, Société Malacologique de Belgique, | 1 | 33 |
| Buenos Aires, Sociedad Cientifica Argentina, | | 1 |
| Buffalo, Historical Society, | 1 | |
| Buffalo, Young Men's Association, | | 2 |
| Burnham, John H., Bloomington, Ill., | 1 | |
| Butler, George, | | 1 |
| Caen, L'Académie Nationale des Sciences, Arts et Belles-Lettres, | 1 | 1 |
| Calcutta, Geological Survey of India, | 7 | 11 |
| Caldwell, Augustine, Ipswich, Mass., | | 5 |
| Cambridge, Library of Harvard University, | | 1 |
| Cambridge, Museum of Comparative Zoölogy, | | 10 |
| Cambridge, Nuttall Ornithological Club, | | 4 |
| Cambridge, Peabody Museum of American Archæology and Ethnology, | 1 | |
| Canterbury, N. Z. Philosophical Institute, | | 3 |
| Case, L. P., Richmond, Ind., | | 12 |
| Cassel, Verein für Naturkunde, | | 1 |
| Chandler, Gardner L., | | 49 |
| Chaney, Geo. L., Boston, Mass., | | 1 |
| Chase, Benj., Auburn, N. H., | 1 | |
| Cherbourg, Société Nationale des Sciences Naturelles, | 1 | 1 |
| Chicago, Historical Society, | 11 | 69 |
| Christiania, Kongelige Norske Universitet, | 2 | 3 |
| Christiania, Videnskabs Selskabet, | 3 | 1 |
| Cole, Miss Caroline J., | | 2 |
| Cole, Mrs. N. D., | 3 | 151 |
| Collett, John, Indianapolis, Ind., | 1 | |
| Columbia, Mo., State University Library | 1 | 2 |
| Conklin, Wm. A., New York, N. Y., | | 2 |
| Cooke, Caleb, | 1 | |
| Cresson, Ezra T., Philadelphia, Penn., | 1 | |
| Crosby, Mrs. M. K., | 415 | 752 |
| Cutter, Abram E., Charlestown, Mass., | | 9 |
| Danzig, Naturforschende Gesellschaft, | 1 | |
| Darmstadt, Verein für Erdkunde, | 1 | |
| De Borre, Alf. Preudhomme, Bruxelles, | | 3 |
| Dodge, Robert, New York, N. Y., | | 1 |
| Doolittle, Miss E., Troy, N. Y., | | 1 |
| Dresden, Naturwissenschaftliche Gesellschaft, "Isis," | | 2 |
| Dresden, Verein für Erdkunde, | | 1 |

| | Vols. | Pam. |
|---|---|---|
| Dublin, Royal Irish Academy, | | 10 |
| Dudley, Charles B., Altoona, Penn., | | 1 |
| Dunning, Rev. Chas. U., Lawrence, Mass., | | 7 |
| Dürkheim, Die Pollichia, | | 3 |
| Edes, H. H., Charlestown, Mass., | 1 | |
| Emden, Naturforschende Gesellschaft, | | 2 |
| Emerton, James H., Newspapers, | | |
| Emilio, Luis F., San Francisco, Cal., | | 1 |
| Emmerton, James A., | | 38 |
| Erlangen, Physikalisch-medicinische Societät, | | 1 |
| Essex Agricultural Society, | | 1 |
| Falmouth, Eng., Royal Cornwall Polytechnic Society, | | 1 |
| Fearing, Andrew C., jr., Boston, Mass., | 1 | 5 |
| Fewkes, J. Walter, Cambridge, Mass., | | 1 |
| Flanders, Rev. G. T., Lowell, Mass., Newspapers, | | 3 |
| Fogg, Miss Ellen M., | 1 | |
| Folsom, Chas. F., Boston, Mass., | 1 | |
| Foote and Horton, Newspapers, | | |
| Foster, W. E., Providence, R. I., | | 1 |
| Fowler, H. Gilbert, and others, Auburn, N. Y., | | 2 |
| Frankfurt, Senckenbergische naturforschende Gesellschaft, | | 5 |
| Frankfurt, Zoologische Gesellschaft, | | 18 |
| Freiburg, Naturforschende Gesellschaft, | | 1 |
| Genève, Institut National Genevois, | 2 | |
| Genève, Société de Physique et d'Histoire Naturelle, | | 1 |
| Giessen, Oberhessische Gesellschaft für Natur und Heilkünde, | | 1 |
| Gillis, James A., | 32 | 33 |
| Goode, G. Brown, Middletown, Conn., | | 1 |
| Goodell, A. C., jr., | 1 | 1 |
| Görlitz, Naturforschende Gesellschaft, | | 1 |
| Göttingen, Königliche Gesellschaft der Wissenschaften, | 2 | |
| Gould, John H., Topsfield, Mass., | 3 | |
| Gould, Miss M. E., | 21 | |
| Gray, Arthur F., Danversport, Mass., | | 1 |
| Green, Samuel A., Boston, Mass., | 10 | 482 |
| Gulliver, Rev. John P., Andover, Mass., | | 1 |
| Halifax, Nova Scotian Institute of Natural Science, | | 1 |
| Hall, E, W., Waterville, Me., | | 1 |
| Halle, Kaiserliche Leopoldinisch-Carolinische Deutsche Akademie der Naturforscher, | | 7 |
| Hamburg, Naturwissenschaftlicher Verein, | | 3 |
| Hamburg, Verein für Naturwissenschaftliche Unterhaltung, | | 1 |

| | Vols. | Pam. |
|---|---|---|
| Hannover, Naturhistorische Gesellschaft, | | 1 |
| Harlem, Société Hollandaise des Sciences, | 1 | |
| Hart, Chas. Henry, Philadelphia, Penn., | | 2 |
| Hawkins, Dexter A., New York, N. Y., | | 1 |
| Hedge, F. H., jr., Lawrence, Mass., | | 20 |
| Henry, Thomas Elder, Dalkey, Ireland, | | 1 |
| Hobart Town, Royal Society of Tasmania, | | 1 |
| Hoffman, Mrs. Chas., | 16 | |
| Holmes, J. C., Detroit, Mich., | 1 | |
| Hoppin, James M., New Haven, Conn., | | 1 |
| Horton, N. A., | 5 | |
| Hotchkiss, Miss Susan V., New Haven, Conn., | | 23 |
| Huguet-Latour, Maj., Montreal, | | 5 |
| Hunt, T. F., | 40 | 75 |
| Ill. State Agricultural Society, | | 1 |
| Israel, Rev. Fielder, Newspapers, | | 50 |
| Ives, H. P., | | 532 |
| Ives, Mrs. Wm., Newspapers, | 76 | 36 |
| Jenison, O. A., Lansing, Mich., | | 2 |
| Jenkins, Chas. T., | 3 | |
| Jocelyn, Miss M. E. W., | | 9 |
| Johnson, Mrs. Samuel, | 1 | 2 |
| Kempf, Matthew, | | 1 |
| Ketchum, Rev. Silas, Poquonock, Conn., | | 3 |
| Kidder, Frederic, Boston, Mass., | | 1 |
| Kimball, James, Newspapers, | 29 | 47 |
| Kimball, Mark, Chicago, Ill., | | 1 |
| Kjöbenhavn, Botanisk Tidsskrift, | | 6 |
| Kjöbenhavn, Kongelige Danske Videnskabernes Selskab, | | 3 |
| Knox, John Jay, Washington, D. C., | | 1 |
| Lander, Miss Elizabeth, | | 8 |
| Langdell, Miss Annie, | | 1 |
| Langworthy, I. P., Boston, Mass., | | 138 |
| Larned, Josephus N., Buffalo, N. Y., | | 11 |
| Lawrence, Geo. N., | | 13 |
| Lawrence, Public Library, | | 1 |
| Lee, Francis H., Newspapers, | 2 | 152 |
| Leeds, Philosophical and Literary Society, | | 1 |
| Le Mans, Société d'Agriculture, Sciences, et Arts de la Sarthe, | | 1 |
| Leveridge, C. A., Dunellen, N. J., | | 1 |
| Liége, Société Royale des Sciences, | 2 | |
| Lincoln, Francis H., Boston, Mass., | | 1 |

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| Lincoln, Solomon, jr., | 37 | 86 |
| London, Royal Society, | | 13 |
| Lord, Mrs. Geo. R., | | 593 |
| Lowell, Old Residents' Historical Association, | | 1 |
| Lund, Kongliga Universitetet, | 2 | 12 |
| Lüneburg, Naturwissenschaftlicher Verein, | | 1 |
| Luxembourg, Institut Royal Grand Ducal, | | 1 |
| Lyon, Société d'Agriculture, Histoire Naturelle et Arts Utiles, | 1 | |
| Lyon, Société Linnéenne, | | 1 |
| Mack, Mrs. David, Belmont, Mass., | 20 | 182 |
| Mack, Miss Esther C., | 1 | |
| Mack, William, | | 4 |
| Madison, Wis. Historical Society, | 1 | |
| Madrid, Observatorio, | 7 | |
| Madrid, Sociedad Española de Historia Natural, | | 1 |
| Manning, R. C., | | 1 |
| Manning, Robert, Newspapers, | | 14 |
| Manson, A. S., Boston, Mass., | | 2 |
| Marburg, Gesellschaft zur Beförderung der Gesammten Naturwissenschaften, | | 9 |
| Marsh, O. C., New Haven, Conn., | | 1 |
| Marshall, John W., Rockport, Mass., | | 1 |
| Martindale, Isaac C., | | 1 |
| May, Calvin S., Danvers, Mass., | | 1 |
| Mecklenburg, Verein der Freunde der Naturgeschichte, | | 1 |
| Meek, Henry M., | 1 | |
| Mexico, Museo Nacional, | | 3 |
| Milburn, Jos., Buffalo, N. Y., | 3 | |
| Mills, Abraham, New York, N. Y., | | 1 |
| Mills, Rev. R. C., | 7 | 183 |
| Milwaukee, Wis., Naturhistorischen Verein, | | 3 |
| Montpelier, Vt., Historical Society, | 1 | |
| Montpelier, Vt., State Library, | 11 | 1 |
| Montreal, Canada, Geological Survey, | 2 | 3 |
| Morse, E. S., | 4 | 46 |
| München Königlich Bayerischen Akademie der Wissenschaften, | | 19 |
| Münster, Westfälische Provinzial Verein für Wissenschaft und Kunst, | | 1 |
| Nagle, John T., New York, N. Y., | | 2 |
| Nashville, Board of Health, | 1 | |
| Neuchatel, Société des Sciences Naturelles, | 1 | 1 |

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| Nevins, W. S., | 8 | 8 |
| Newark, N. J., Historical Society, | | 1 |
| Newhall, Miss Eliza G., | | 1 |
| New Haven, Conn., Academy of Arts and Sciences, | 1 | |
| New Haven, Yale College Library, | | 1 |
| New York, Academy of Sciences, | | 4 |
| New York, American Chemical Society, | | 1 |
| New York, American Geographical Society, | 2 | 4 |
| New York, American Water Color Society, | | 1 |
| New York, Chamber of Commerce, | 1 | |
| New York, Genealogical Biographical Society, | | 4 |
| New York, Historical Society, | | 1 |
| New York, Mercantile Library Association, | | 1 |
| Nichols, The Misses, | 6 | |
| Noble, Edward H., | 39 | 21 |
| Norfolk, John R., | 44 | 89 |
| Oliver, Henry K., | 26 | 62 |
| Orange, N. J., N. E. Society, | | 1 |
| Packard, Mrs. A. S., jr., | 1 | |
| Paine, H. D., New York, N. Y., | | 3 |
| Palfray, Chas. W., Newspapers, | | 143 |
| Paris, Athenée Oriental, | | 1 |
| Paris, L'Institution Ethnographique, | | 4 |
| Paris, Société Américane de France, | | 1 |
| Paris, Société d'Acclimatation, | | 16 |
| Paris, Société d'Anthropologie, | | 5 |
| Paris, Société des Etudes Historiques, | | 10 |
| Peabody, John P., | | 12 |
| Peabody, Mass., Peabody Institute, | | 1 |
| Peet, Rev. S. D., Clinton, Wis., | | 3 |
| Peirce, Henry B., Secretary of State, Boston, Mass., | 4 | |
| Pennsylvania, University of Medical Department, | | 1 |
| Perkins, Geo. A., | | 49 |
| Perkins, Henry, Philadelphia, Pa., | 16 | 65 |
| Perry, Wm. Stevens, Davenport, Iowa, | | 1 |
| Petterd, Wm. F., | 1 | |
| Philadelphia, American Philosophical Society, | | 3 |
| Philadelphia, Library Company, | | 2 |
| Philadelphia, Mercantile Library Company, | | 1 |
| Philadelphia, Numismatic and Antiquarian Society, | | 3 |
| Philadelphia, Pennsylvania Historical Society, | | 5 |
| Phillips, Henry, jr., Philadelphia, Pa., | | 6 |
| Phoenix, S. Whitney, New York, N. Y., | 3 | |

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|---|---|---|
| Pickering, Mrs. Chas., Boston, Mass., | 1 | 1 |
| Pickering, Miss Mary, . . . . Newspapers, | 9 | 11 |
| Pierce, B. O., Beverly, Mass., | 1 | 3 |
| Pool, Wellington, Wenham, Mass., | | 3 |
| Poore, Ben. Perley, Washington, D. C., | | 1 |
| Pope, Miss Lydia, | 1 | |
| Porter, Robert P., Chicago, Ill., | | 1 |
| Prince, Geo. H., St. Petersburg, | | 1 |
| Princeton, N. J., E. M. Museum of Geology and Archæology, | | 1 |
| Procter, Joseph O., Gloucester, Mass., | | 1 |
| Providence, Rhode Island Historical Society, | | 1 |
| Putnam, Rev. A. P., Brooklyn, N. Y., | | 1 |
| Putnam, F. W., . . . . Newspapers, | | 34 |
| Quebec, Literary and Historical Society, | | 1 |
| Regensburg, Königliche bayerische botanische Gesellschaft, | 1 | 1 |
| Rhees, Wm. J., Washington, D. C., | | 1 |
| Rice, Wm., Springfield, Mass., | | 1 |
| Robinson, John, . . . . Newspapers, | 2 | 185 |
| Ropes, N., Cincinnati, O., | 1 | 1 |
| Ropes, Miss S., | 1 | |
| Ropes, Rev. Wm. L., Andover, Mass., | | 1 |
| Sale, Chas. L., Chelsea, Mass., | 1 | |
| Sale, John, Chelsea, Mass., | 2 | 3 |
| Salem, Ladies' Centennial Committee, | 6 | |
| San Francisco, California Academy of Sciences, | | 1 |
| San Francisco, Mercantile Library Association, | | 1 |
| S'Gravenhage, Nederlandsche Entomologische Vereeniging, | | 3 |
| Shepard, Jas. E., Lawrence, Mass., | 1 | 51 |
| Shepard, Miss Nellie J., New York, N. Y., | | 5 |
| Silsbee, Mrs. B. H., | 204 | 770 |
| Sinclair, Chas. A., Boston, Mass., | 1 | |
| Soule, Chas. C., Boston, Mass., | 1 | 9 |
| Spofford, A. R., Washington, D. C., | | 1 |
| Stearns, Robert E. C., San Francisco, Cal., | | 1 |
| Stearns, Samuel, Lawrence, Mass., | 1 | 2 |
| Stearns, W. A., | 4 | |
| Steiger, E., New York, N. Y., | | 1 |
| St. Gallen, St. Gallische Naturwissenschaftliche Gesellschaft, | | 1 |
| Stickney, Miss Cornelia, | | 17 |
| Stilson, Rev. Arthur C., Ottumwa, Iowa, | | 1 |
| St. Louis, Mo. Academy of Science, | | 1 |

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|---|---|---|
| St. Louis, Mo. Public School Library, | | 2 |
| Stone, Miss Mary H., Newspapers, | | |
| St. Paul, Minnesota Historical Society, | 16 | 15 |
| St. Pétersburg, Académie Impériale des Sciences, | | 7 |
| St. Petersburg, Imperial Botanical Garden, | | 1 |
| Stroyer, Rev. Jacob, | | 1 |
| Sydney, Royal Society of New South Wales, | 2 | |
| Tanaka, His Excellency Mr., Tokio, Japan, | 2 | 2 |
| Tasmania, Government of, | 1 | |
| Taunton, Eng., Somersetshire Archæological and Natural History Society, | 1 | |
| Taunton, Mass., Old Colony Historical Society, | | 1 |
| Taunton, Mass., Public Library, | | 2 |
| Taylor, Wm. B., Washington, D. C., | 1 | |
| Tenney, Mrs. H. A., Lansing, Mich., | 1 | |
| Thomson, Peter G., Cincinnati, O,, | | 1 |
| Topeka, Kansas Historical Society, | | 2 |
| Townsend, John P., New York, N. Y., | | 3 |
| Trondhjem, Kongelige Norske Videnskabers Selskab, | | 3 |
| Tuttle, Chas. W., Boston, Mass., | | 1 |
| Unknown, | | 7 |
| Upham, Wm. P., Newspapers, | | 46 |
| Upton, Jas., Estate of the late, | 19 | 63 |
| Upton, Winslow, Detroit, Mich., | 1 | |
| U. S. Bureau of Education, | 2 | 2 |
| U. S. Dept. of Agriculture, | | 1 |
| U. S. Dept. of Interior, | 2 | 2 |
| U. S. Dept. of State, | 1 | |
| U. S. Engineer Dept., | 7 | |
| U. S. Naval Observatory, | 4 | 10 |
| U. S. Patent Office, | | 53 |
| U. S. P. O. Dept., | 1 | |
| U. S. Treasury Dept., | 3 | 5 |
| Utica, Oneida Historical Society, | | 1 |
| Verrill, A. E., New Haven, Conn., | | 1 |
| Wadsworth, H. A., Lawrence, Mass., | 1 | |
| Wallis, Al. C., Upsala, | | 3 |
| Walter, Jos. R., Wilmington, Del., | | 1 |
| Walton, E. N., | | 82 |
| Washington, D. C., Smithsonian Institution, | 1 | 9 |
| Waters, E. Stanley, | | 11 |
| Waters, J. Linton, | | 64 |
| Waterville, Me., Colby University, | | 2 |

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|---|---|---|
| Watson, Miss C. A., | 1 | 1 |
| Welch, Wm. L., | 2 | 4 |
| Wheatland, Miss E., Newspapers, | | |
| Wheatland, H., Newspapers, | 14 | 21 |
| Wheatland, Miss Martha G., | 2 | 11 |
| Whipple, Geo. M., Newspapers, | 1 | 6 |
| Whipple, S. K., Newburyport, Mass., | | 2 |
| White, Rev. Wm. O., Boston, Mass., | | 6 |
| Wien, K. K. Zoologisch botanische Gesellschaft, | 1 | |
| Wien, Verein zur Verbreitung Naturwissenschaftlicher Kentnisse, | 1 | |
| Wilder, Marshall P., Dorchester, Mass., | 2 | 5 |
| Wilkins, Mrs. Chas., | 1 | |
| Wilmington, Delaware Historical Society, | | 2 |
| Willson, Rev. E. B., | | 41 |
| Winthrop, Robert C., Boston, Mass., | | 2 |
| Woods, Mrs. Kate T., | | 146 |
| Worcester, American Antiquarian Society, | | 2 |
| Worcester, Society of Antiquity, | | 1 |
| Wurzburg, Physikalish-medicinische Gesellschaft, | 1 | 2 |
| Zurich, Naturforschende Gesellschaft, | | 4 |

The following have been received from editors or publishers:—

American Bookseller. [Arts.
American Journal of Science and
American Naturalist.
Bangs' Catalogue.
Beverly, N. J. Banner.
Boston Herald.
Canadian Entomologist.
Canadian Naturalist.
Cape Ann Bulletin.
European Mail. [Journal.
Familiar Science and Fanciers'
Francis' Catalogue.
Gardener's Monthly.
Ipswich Antiquarian Papers.
Lawrence American.
Librarian.
Lynn Reporter.
Musical Herald.
Nation.
Nature.
Our Dumb Animals.
Peabody Press.
Peabody Reporter.
Quaritch's Catalogue.
Review, P. H. S. [Friend.
Sailors' Magazine and Seamen's
Salem Gazette.
Salem Observer.
Salem Post.
Salem Register.
Turner's Public Spirit.
Vox Humana.
Zoologischer Anzeiger.

Horticulture.—The annual Horticultural Exhibition opened on Tuesday, Sept. 9, 1879, and closed on Thursday evening, Sept. 11. The display was good, the flowers, ferns, pot plants and gladioli being very beautiful. There was a good show of vegetables and fruits; of the latter, the pears took the lead in the number of varieties. David Wentzell had some handsome Gravenstein apples and other fruit, also a good display of vegetables; F. H. Appleton a fine collection of the products of "Broadfield's Farm;" the Plummer Farm School some giant Ruta-bagas Mangel-wurtzel, and Stone Mason cabbage, etc.; R. B. Gifford and Samuel W. Pease some mammoth early Crawford peaches; Henry Poor some fine clusters of grapes, Hamburgs and Black Prince; T. Putnam Symonds a good cluster of Hartford Prolifics; Mr. Wilkinson, figs.

The centre of the hall was occupied with potted ferns and plants from the greenhouses of John Robinson and H. W. Putnam; Charles A. Putnam a beautiful pyramid of gladioli, at the head of the hall a handsome collection of asters, coleus, and pinks.

Among the exhibitors were the following:—Charles A. Ropes, seventy-five dishes of fruit, George Pettingell, forty-nine dishes, Aaron Nourse, thirteen, David Wentzell, twenty. Fruit from George Bowker, E. H. Noble, John Osborne, T. P. Symonds, Miss S. Ropes, Wm. H. Dennett, Wm. Mack, George D. Putnam, Ezekiel Goss, Miss E. P. Richardson, William L. Welch, Joseph Symonds, James P. Cook, Mrs. M. Wilkinson, J. W. Barton, George D. Glover, Mrs. Wm. F. Gardner, C. A. Buxton, John W. Grant. Cut flowers from Mrs. C. A. Ropes, H. W. Putnam, Mrs. C. H. Miller, Mrs. W. F. Gardner, Mrs. E. D. Kimball, Mrs. J. P. Cook, Joseph Symonds, Wm. H. Whipple, B. D. Hill. Ferns from John Robinson. Pot plants from John Robinson,

Henry Poor, Dr. H. C. Merriam, Miss Wilkinson, Mrs. J. P. Cook.

Art Exhibitions.—There have been during the past year, two exhibitions by the artists and amateurs of Salem and its immediate vicinity—under the direction of the Curator of Art. The first was held on Wednesday, Thursday, and Friday, June 11, 12 and 13, 1879. The collection was confined, with one or two exceptions, to the works of the artists of Salem, and as such was extremely gratifying to all who are interested in æsthetic culture—comprising some fine oil paintings, beautiful sketches in water colors, charcoal, and crayons; tiles and decorated china, some charming results of the Potters' wheel, almost equalling Limoges and Faience; a good exhibit of pottery from the Beverly establishment; some excellent mechanical drawings, original designs for oil cloths, etc., the work of the pupils of our public schools. Some fifty-three artists represented were residents of Salem, contributing over two hundred paintings and specimens of decorative art.

The following is a list of the principal pieces on exhibition:—

St. John the Baptist and other pictures, Miss Mary R. Kimball; head (oil), pencil drawings, Mrs. Horace S. Perkins; oil paintings, C. C. Redmond; Cashmere goat, Sybil (copy), Chilian milk venders, D. M. Shepard; oil paintings, J. Mackintire; rocks at Marblehead, Julia S. Warden; water colors, C. P. Brown; souvenir of Lexington, Henry Chapman; head in charcoal, water colors, storks, pottery, Miss M. M. Brooks; house, seven gables, Geo. M. White; dog's head, tile, G. B. Haskell; old Notch house, Miss Agge; pencil drawing, H. R. Stone; Beverly shore, oil pictures, pastel, Miss Louisa Lander;

wild flowers, Miss C. Grant; water colors, Miss A. Cassino; charcoal sketch, Miss J. F. Barker; violets, apple blossoms, and other pictures, Miss E. B. Gardner; crayon, storks, W. W. and F. L. Morse; drawings, Mrs. H. C. Weston; drawings by M. Kilham, A. L. Cone, E. French, B. Whitney, L. Atwood, S. S. Kimball, S. S. Kelley, J. J. Redmond, A. Porter, H. E. Carlton, C. S. Sanborn, M. L. Hill, H. G. Hale, F. L. Morse, F. Moody, H. Effie, C. S. Bliss. Oil panels, Miss E. K. Bolles; panels, Miss A. B. Holden; oil (hare), Mrs. G. P. Osgood; fuchsia, Miss S. S. Kimball; Japanese tea pot, C. K. Bolles; views in Beverly, A. E. Downes; sketches in oil, Miss H. F. Osborne; water colors, Miss L. L. A. Very; collection of pencil and pen drawings by J. H. Emerton; charcoal drawings, G. L. Chandler; six charcoal sketches, Miss S. E. Smith; collection of thirty-nine sketches in oil and charcoal, from nature and objects, by Miss S. E. Smith and pupils; three oil paintings, C. P. Brown; stork, cast from model, Miss M. E. Stanley; oil panel, charcoal and other sketches, Miss H. K. Osgood; six oil paintings, Misses Williams; oil panels, Miss Kinsman; charcoal sketches, Miss Phippen; Sorento carving, W. W. Northend; pen and ink panel, Miss Northend; wild flowers, Miss E. D. Williams; tea pot and tray, Miss Cassino; decorated mirror frame, Miss A. Perkins; apple blossoms, Miss M. A. Cook; lilacs, pansies, (panels), horse chestnuts (oil), Miss S. E. C. Oliver; heads, oil, quick sketches, Miss H. F. Osborne; five water colors, Miss K. Peirson; four oil pictures, C. C. Redmond; thirteen oil pictures, George Newcomb; collection of seven sketches in water colors, by Chas. F. Whitney and pupils; popular and choice decorations, Misses Lander, Hood, Chadwick, Perkins, Williams, Machado, Willson, Cleveland, Smith, Silsbee, Brooks, Pratt, Osgood, King,

Phillips, Mr. G. B. Haskell, Mr. W. W. Northend; embroidery, Misses Peirson, Chadwick, Forrester, Mrs. E. S. Johnson, Mrs. J. Robinson; tiles painted in oil, pupils of Miss S. E. Smith.

The *Second Exhibition* opened on Thursday, April 29, 1880. The collection embraced some three hundred and fifty contributions, covering a wide range in variety of oil, water-color, crayon, charcoal and sepia sketches, elegant Kensington work, decorated china, plaques and panels, pottery and screens with laces and embroidery.

Among the artists whose works were represented are the following: — clay models and oil paintings, Miss L. L. A. Very; two oil paintings, Miss Ida Caller; oil painting, Miss H. F. Osborne, and one from Miss A. Machado; two paintings, ornamented plate, Miss L. B. Hood; marine view, Clark Oliver of Lynn; seven paintings, G. L. Chandler; two views, Mrs. N. A. Frye; "Low Tide," H. A. Hallett; tile and decorated china, Mrs. N. A. Frye; decorated fans, etc., Miss Charlotte Chase; two pencil studies, Miss Mary L. Webb; table cover, door panel, and fire screen, Miss C. L. Grant; oil painting, Thomas Pitman; two paintings, Helen Philbrick; do. Miss C. S. Philbrick; ornamented tile, Miss M. P. Ober; ornamented tile and china, Abby G. Pingree; two views, J. W. Averill; lace work, Mrs. H. M. Toppan; ornamented fans, Miss E. Phillips, Mrs. J. C. Lee, and Mrs. F. H. Lee; six paintings, Martha O. Barrett of Peabody; painting of flowers, Miss E. E. Barrett; water colors, Miss M. Taylor and M. A. Fornis; four oil paintings, Mrs. C. N. Clark; paintings and embroidery, Miss M. R. Stevens; charcoal drawing and pen and ink sketch, J. W. Thyng and Miss S. C. Harris; panel pictures, Mrs. George H. Jacobs; water colors and char-

coal drawings, Miss H. M. King; pen and ink drawings, Mrs. N. G. Symonds; flowers, Miss E. R. Plaisted; oil painting, Mr. C. C. Redmond; ornamented tile and panels, Miss H. L. Kimball; oil paintings, Miss S. E. Pratt; ornamented china, etc., from Miss E. W. Chadwick and Miss A. B. Holden; decorated plate, Miss A. F. Perkins; three easels, Mrs. Chas. W. Perkins; charcoal drawings, Miss E. A. Nichols; "Derby wharf," C. P. Brown; ornamented tile, Henry A. Chapman; embroidered work, Mrs. G. F. Ropes, Susie O. Currier; inlaid work, C. E. Larrabee; oil sketches, Miss H. K. Osgood; panel pictures, Mrs. G. P. Osgood; table cover, Miss M. W. Farrington; charcoal sketch, Mrs. E. S. Johnson; crayon drawing, Miss A. H. Short; landscapes on fans, Miss A. Sweetser; oil colors and plate, Miss E. T. Dike; embroidered work, Mrs. G. B. Jewett; twelve cards, Miss Lucy H. Cleveland; ornamented vases, C. A. Lawrence; crayon and pen sketches, Arthur M. Frye; panel, Miss E. F. Earle; plate, Miss Lander; lion's head from a cast, Miss A. A. Agge; lambrequin, Miss Ella W. Fisk; crayon work, Miss M. E. Dockham; blankets, Miss A. Pitman; oil painting, plates, cups and saucers, Mrs. E. S. Johnson; india ink drawings, Mrs. H. H. Davis; paintings, by Miss S. E. C. Oliver and eight of her pupils; sketch of E. I. Marine Hall, interior view, by J. H. Emerton; embroidered work, by Mrs. P. T. Pickering and Miss E. R. Pickering; oil colors, Miss E. B. Gardner, and Misses E. B. and Bessie Gardner; apple blossoms, Miss Goldthwaite; water colors, Miss M. M. Brooks; crayon portraits, C. H. Fillebrown; fans, Mrs. R. C. Manning; painting, Miss A.L. Pike; oil colors, J. S. Warden; panels, Mrs. C.W.Smith; fans and lace, Misses M.G.and E.Wheatland; apples, Annie Forrester; fancy work, Miss E. Forrester; paintings, Miss Nellie Phippen; pen and ink drawing,

fancy cards, Geo. M. White; screens and panels, Miss Holden; fans, Miss Susan E. English; water colors and fan, M. E. Stanley and Miss Ada Pitman; flowers, Mrs. Jos. Symonds; oil paintings, Misses M. E. and A. O. Williams; drawing on wood, Miss Rosie Symonds; fan, Mrs. H. S. Perkins; water color studies, Mrs. C. W. Smith; embroidery, Miss Nellie F. Clarke; bracket, S. C. Weston; water colors, G. W. Harvey of Gloucester; sofa pillow, Miss F. L. Pitman; Kensington work, Miss A. Chadwick; worsted work, Miss L. Eaton; tile and stand, Miss E. W. Chadwick; interior of Dr. Bolles' study, Kimball Bolles; two drawings, each of a locomotive, one by George H. Goodell aged nine years and the other by Henry Gardner aged seven years, were very noticeable under such circumstances. A screen by Miss Edith Rantoul; a case of fine specimens of pottery in original designs, made from Salem clay and baked in this city, by Miss Louisa Lander, occupied the centre of the hall. Miss L. has been for some time experimenting in glazes, and has discovered one which appears to be fully equal to that of the celebrated Limoges ware for depth and brilliancy of color. An imitation of Japanese ware was also good.

Museum.—The specimens in Natural History including those in Ethnology and Archæology, which have been given during the year, are on deposit with the trustees of the Peabody Academy of Science, in accordance with previous arrangement. These have been reported at our meetings and have been duly acknowledged to the several donors. In addition to the above those of an historical character or possessing artistic interest have been arranged in the rooms. The following may be specified as contributors: John Robinson, Miss M. E. Briggs, Charles T.

Perkins, Miss Ravel, Miss E. B. Gardner, James Kimball, J. H. Huntington, Robert Brookhouse, Miss F. P. Ashton Snow, Edw. Stanley Waters, W. Kite, Caleb Buffum, E. C. Bolles, David Nichols, A. S. Peabody, Mrs. N. D. Cole, T. B. Nichols, H. K. Oliver.

PUBLICATIONS have been issued as heretofore,—the BULLETIN, vol. xi, and HISTORICAL COLLECTIONS, vol. xvi. The exchange list, with few exceptions, continues the same as last year.

MANUSCRIPTS from Miss Mary E. Briggs, Mrs. James Pope of Melrose, Miss Caroline R. Derby's estate, George E. Emery of Lynn, Mrs. Joseph S. Cabot, James A. Gillis, Caleb Buffum, John A. Norfolk, and T. F. Hunt.

FINANCIAL.—The Treasurer's Report exhibits the receipts and expenditures of the past year, presented in detail, but here condensed for printing.

RECEIPTS.

| | | |
|---|---|---|
| Balance on hand, commencement of year | | $254 76 |
| *General Account.* | | |
| Salem Athenæum ½ expense, 1878—$136 90 | | |
| " 1879 127 87 | = $264 77 | |
| Dividend and return tax | 31 77 | |
| Assessments, 888 00; Publications, 582 67; Donations, 47 50, = | 1,518 17 | |
| Lectures, Concerts, Excursions and Hall, | 2,904 10 | |
| | | $4,718 81 |
| *Historical Fund.* | | |
| Interest of investment, | | 43 50 |
| *Natural History Fund.* | | |
| Interest of investment, | | 28 00 |
| *Davis Fund.* | | |
| Interest of investment, | | 482 85 |

*Ditmore Fund.*

| | | |
|---|---|---|
| Interest of investment,..... | | 180 00 |

*Manuscript Fund.*

| | | |
|---|---|---|
| Interest of investment,..... | | 40 08 |

*Ladies' Fair Fund.*

| | | |
|---|---|---|
| Interest of investment,..... | | 60 00 |

*Derby Fund.*

| | | |
|---|---|---|
| Rent of land,..... | | 30 00 |

*Wm. B. Howes Fund.*

| | | |
|---|---|---|
| Received from executrix,..... | $24,400 00 | |
| Interest received since investment,..... | 395 00 | |
| | | 24,795 00 |
| | | $30,633 00 |

EXPENDITURES.

*General Account.*

| | | |
|---|---|---|
| Salem Athenæum, rent 1878—$350<br>" 1879— 350 } =..... | $700 00 | |
| Salaries, $2,045 00; Publications, $1,668 93 =..... | 3,713 93 | |
| Fire Insurance $60; Books 107 82 =..... | 167 82 | |
| Sundry Accounts,..... | 368 80 | |
| | | 4,950 55 |

*Historical Fund.*

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|---|---|---|
| Book binding,..... | | 116 00 |

*Natural History Fund.*

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| Book binding,..... | | 21 50 |

*Davis Fund.*

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| Interest Warren Savings Bank [Funded]..... | | 102 85 |

*Ditmore Fund.*

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| F. J. Perkins, Annuity,..... | | 100 00 |

*Manuscript Fund.*

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| Interest Five Cents Savings Bank [Funded]..... | | 40 08 |

*Howes Fund.*

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| Amount invested, per Separate Report,..... | | 24,496 91 |
| Paid on account of old note..... | | 300 00 |
| Balance in hands of Treasurer,..... | | 505 11 |
| | | $30,633 00 |

On Friday, the 22d of June next, will occur the two hundred and fiftieth anniversary of the landing of John Winthrop on these shores. It is proposed to hold the first Field Meeting at that time. Robert S. Rantoul, Esq., has accepted an invitation to deliver the address; Miss Lucy Larcom to prepare a poem. Other gentlemen will be present and take part in the exercises of the day, and it is hoped that the occasion may be a successful commemorative event. The meeting will be held at the Pavilion on Salem Neck.

Additions to the Library and the several collections are constantly being made by donations and from other sources. The subject of increased accommodation for the valuable material, so fast accumulating will, ere long, require the consideration of the officers, members, and friends of the Institute; whether the present is the most suitable time to make a general effort to provide means for a fire-proof building is an important question to decide. That the society needs and ought to have such a building, no one will deny.

The Treasurer reports the payment of the generous bequest of the late Wm. B. Howes to the Institute, and makes a clear and full report of the finances.

In concluding this retrospect of the doings of the Institute during the year, it is hoped that these annual exhibits, of a steady and healthful growth in the right direction, and of a gradual advance in the promotion of its various objects, will secure the respect and good wishes of the community at home and abroad.

MONDAY, MAY 24, 1880.

MEETING this evening. The PRESIDENT in the chair. Records read.

Mr. EDWARD A. SILSBEE gave

AN INFORMAL TALK, ON SUNDRY ARCHITECTURAL AND ART TOPICS.

Coming from Boston there is an old house standing alone in a beautiful open spot sloping to the water. It is very old. Like the venerable men who came down to us from a former generation, this has descended from many. It is refreshing and unchanged in an ever-new land. Long may it remain. I look upon it with affection. Two centuries speak through it. It takes us back to witchcraft. Its black color the winds and weather have painted. It is flat on the ground. One massive chimney is stacked in the centre, clustered in masses and solid as the earth. It is simple as a Doric temple and not unworthy as a human record to stand beside it. The bleak centuries have howled about it and raved, life has gone on there and it has threaded its way to our time. Fire has spared it.

Bare, bald, unornamented, these houses are like monuments of the past. They plead with posterity. They seem to say to us: "Disturb us not, respect old age." It touches us with pathos. It is a voice of Pilgrim days, of Indians, of Quakers, a new continent, a worthy beginning when life was barely lodged here and struggling for a place to plant itself, and the nation was young and civilization new. The Indians saw its raising. The Pilgrim struggled with the savage. Where there are so few symbols, such a paucity of relics, and the centuries are so rare, indeed, we cannot afford to neglect them, these old

houses. They are our century flowers, as the mediæval cathedrals are Europe's and as significant, in their way, of the stern unconquerable faith that brought them here.

I insist upon them for they are memorable to the eye and to the feeling.

One catches me, as I go to the Beverly station, with its impressive bulk, and one huge chimney showing above the trees. How they reproach the puniness of later times, monoliths, no one divided their mass or exhausted their simplicity. A history and character are in them, they are gothic. Our life is raw enough, and new, and needs to be tempered by the past. Character is like geology, the world is built into it. Where we have so little old, what with constant fires, and changes, and building over and over on the same spot (it seems as if the American resented an old thing, or were ashamed of it; and inside our houses, what wont our women do)? we should preserve what we have. We need it in our bustling modern life. Every appeal the past makes is refining, humanizing. It seems our buildings are tents from which we remove as easily. The American is a kind of Bedouin for shiftiness of place. The past is obliterated ruthlessly.

One cannot exaggerate their impressiveness. The puritan might come out of them to-morrow. They are the only mementoes we have. Two hundred years old! what else have we so old as that? Why, everything is five or fifty years old here at best! As expressive are they in their homely worth as the cathedrals of their enriched and stately worship. The tooth of time has gnawed at them in vain. They feast the eye and repose the mind. The slope in front is dotted with apple trees, itself a curly dot. This busy sturdy tree is just like the people, and of most expressive growth. Like a bustling housewife, it has a domestic air, like fowls—a barnyard tree. It seems to belong to the house, to be one of the family,

no tree comes so near to us ; there is thrift in every branch. It has something to do. It is not idle or lazy like the elm, for dawdling and showing off. Well, that's better than the weeping willow, a pure bit of sentimentalism in nature. The elm is another type, very varied, sometimes great and noble, more often scrawny, coarse and rank, of poor foliage and vegetable growth, not well knit, forked rather than right-angled, of a feathery plumy shape, not appropriate for tree form. It is like our thin sentimentalism and rage for effect. We are not yet knit in the fibre of maturity. The elm has not half the character of the apple.

This house of which I speak is at the entrance of Revere, to the left. Coming through the town there is another on the same side of similar age. Here is a chimney of very pretty design, terminating in two pierced or looped pinnacles with a solid member between.

The situation and the ride altogether are lovely. Hills of exquisite slope, mild declivity, as Byron says : fair, wide-stretching views open as the sky, an unoccupied country ; the ocean peering in the land ; thicketed rocks, purple crimson-stained meadows, salt grass, and the sturdiness and strength of things seize you like a passion. Salt marshes season our very bones.

There was poetry in the old scattered colonial times, though nobody has found it out. Hawthorne is too subjective, introspective to do it justice. He would deck it out in colors of romance which it will not bear. We need a Walter Scott with homelier touch, and a simple objectivity and picturesqueness. It is the ocean and the land at play which produce this coast about Boston, as if they dallied with each other, and did not know which was which, and were locked in sweet embraces. No lovelier mingling of marsh and hill exists.

These houses are apart from all other periods. They

brought the feelings which originated them with them. They root themselves in the ground from which they grow. The mass is a simple unity. Nothing has been done here so severely full of character. They are the earliest and best things in design the country possesses. Doric in simplicity, Gothic in skyey feeling, the vast slope of the roof makes a splendid line of continuity. Nothing in Europe is finer than their simple expressiveness and detached character. They grow from the soil. This was gothic feeling, to begin from the ground. It plants itself like a tree or a mountain, and clasps the soil in which it roots itself. Classic is lodged, superimposed, and has no principle of growth, nor is it so near to the earth and representative of it. They are large, at least in effect—Doric did not depend for its grandeur on size—majestic. They hold us by a spell of the imagination like early records. The imagination wants a background in which she can paint something. She is worried in the present. They are generally isolated, or were originally. They were generous of land in those days. They rule the domain, are emphatically mansions of a primitive type, boulders from a mightier past. Like the grim towers and castles of the middle age which lie like a vast skeleton over Europe, they reflect another age. The baths, the bridges, the huge amphitheatres scattered over southern Europe and along the Mediterranean are the mastodon of Rome—an extinct species. The pyramids, like mountain tombs in a desert land, are the bones of Egypt. The age they represent is gone completely as the feudal time. How finely were they in character with that great man the puritan.

It is mass makes architecture, and proportion, the arrangements of it, and the cunningness of line and parts. This great lean-to is like a hood to the house, as if it

were drawn over it to cover it, and looks marvellously comfortable smothered in storm as they must have been in those days, and away from neighbors. Like an ark, it shelters from winds and weather. They are the only tender memorials of the first primitive time we have. There are no graves. Whenever I see one of these houses I am carried back two hundred years in a twinkling, transported out of this present and landed in the dim past. Can anything else do it for us here? does anything else?

Walking the other day in North Andover, I was delighted with the design of a chimney. In that house the inmates were scalped by the Indians. An architect had stopped the previous season to sketch it. Richly clustered it was like a bit of gothic times.

A hundred years passed, the colonists were rich. Ornateness came and social charm. The houses were still flat on the ground, and the lawn came in at the window. There was much dignity preserved and breadth to the end of the century, and then character passed out. Houses were perked on underpinnings and no sense of design left. They were comfortable, but not architectural. The time of the Hancock house and Pickman house, in this town, was the first ornate period and the best. It seems to me there have never been houses here possessing more quiet dignity and charm. They were fifty feet away from the street. A rich scroll ornamented the ample doorway, and often a leaden image between. How this fascinated the boys! The massive knocker did away with the vulgar tintinabulation of bells.

The pineapple house on Brown street was my boyish landmark, and how sweet and tender that house still is, put by in a side street. In 1810 the houses were ten feet from the street, and one approached them by flaring stone

steps. Imposing as this was, it was not domestic. The old charm and rusticity of placing had gone. They still build in England on the grass and always have. Why we, who have the drier climate, should ascend into the air I cannot tell. Perhaps the snow banked against the wooden house rotted it, but they did not find this out for a hundred and fifty years. At any rate it ruins houses for beauty to place them away from the soil, the grass, the shrubs. These should nod into the windows and bower the porch, as if they belonged to the family, and the sweep of lawn and floor should be one—at least for beauty and sentiment, and I believe it can be reconciled with health. In 1800 the house of Judge Endicott was raised but it is still away from the street. A beautiful doorway and sweet house next Mr. Willson's church, down street, was raised in the same way; the roofs of these houses were full of cheer; much may be made of roofs. They are in themselves an architecture. How they disappeared afterward; nothing was made of them until these late years, when they have been overdone with no correct pure feeling. Walking along the delightful old streets of Salem, or any similar New England town, this feature, with the benignity of it, and the tender placing on the ground, charm one. How vulgar the later building, gingerbread ornaments, bed-post details and designs turned out by the lathe!

Until, in these late years, education is ridding us of this display of cheap commonplace; but now the architect runs wild with us, as formerly the builder. Breadth, proportion, repose, we rarely see it now as it prevailed to 1800 —simple dignity. This has given way to such countless variety of styles that I hold it a reproach to architecture, that it never does anything of its own but constantly reproduces, imitates, selects. In their day the styles suf-

ficed, and expressed something, the feelings of the occupants and the time. Now we are Chinese or Peruvians in the same breath. Architecture cannot be a living art when it chooses so widely. They could not build but as they did in the good periods. They knew nothing better, or other.

Salem was fortunate in possessing one architect of great merit at a later date. Macintire had the genius of the renaissance. His designs are most refined and delicate. He has left the best church of the steeple spire order that can be seen in New England. This is the one in Chestnut street. The fine steps have been taken away and the door injured. A charming design was the house of Mr. Rogers, opposite the market. The upper part is still beautiful. The Assembly house in Federal street is another. The old common gates were very stately, and showed true style.

There was a period of Doric taste, Tuscan Doric, which has left admirably proportioned roofs and noble porches. The Stearns house has one, and there is one in Chestnut street. These are the sifted results of centuries of architectural feeling. Wherever one has attempted to replace them with other designs or proportions one has made a sad bungling. These old styles, if once meddled with, are ruined. Such was the case with the Boardman house, built by my grandfather, opposite the eastern gate of the common, once excellent for porches and proportion. The proportion of the roof remains. General Washington was astonished, on his visit to Salem, that a sea captain could build such a house. In those primitive days it was the largest around the mall.

As an illustration of the styles, and the contrast they present, the imaginative significance of them, it is instructive to study two late churches in Boston, the one

in Arlington street and the other in Berkeley. The one is composite, the other gothic. The Arlington street is a very poor production in its own style, has no just proportion nor elegance and is a clumsy copy of St. Martin's In The Fields, in Trafalgar Square, London. The steeple spire can never have much inspiration in it though it may have elegance. Spires are gothic. They are the fine fruit of its aspiration. Gothic is a thirst, a climbing, an aspiration. Great interiors, with ribbed and bended roofs, are like hands folded in prayer, and stretched to heaven. Every moulding is an emotion, pinnacles are ecstasy, niches are psalms, shafts are anthems, stained glass the heaven itself, sunset or the dawn. Gothic is like soul in style, classic mind; the one poetry, the other prose; gothic feeling, classic thought. One is of heaven, the other earth. However broken, the snatches of it enchant, like strains of music. As a natural vegetation, it entwines, shoots, and embraces. It is mysterious, exuberant, unending. It is like a monument to nature built by man. In no other style has the spire a *raison d' être*. Others are piled up, imposing, but not inspired. Grace, majesty, proportion, design, do not supply this motive of soaring, vaulting growth, and piercing exultation. They are cold. Gothic is as multitudinous as nature. She might have done it herself. It is like three centuries of Shakespeare. In its greatness, all men's lives were in it, and all their lives. Other styles eke out their outlines with clumsy expedients, urns, and vases, and knobs. Gothic produces every part out of every other part, naturally, as nature works. It is evolved, integral, fused. In other styles ornaments are lodged, attached, in this they grow. One is constructed, the other lives. Composite styles miss the inevitable, as Wordsworth says, Goethe's lines do. They have descended from ancient times, and nothing akin anciently

had place; no feelings of mystery strove and struggled for expression, nor were they possessed with the passion of the infinite, which is the principle of gothic. Faith did not flame in the air. The earth sufficed, and they symbolized it. All notes of action seem natural to gothic. The members multiply, cluster, divide; they mantle, reach, rush, throng and cling upward. It was the literature of the middle age. The people read in it, as in a book; their sanctuary and catechism. Religion is in every turn, and twist, and point, and pinnacle; and so was life. It is fervid, swift, kindling, and has well been called frozen music. It has a unity like faith itself. It is embodied religion. Nothing touches us like this ecstasy and prayer that it is—a message sent to heaven, pointing to the other world—so impassioned, it cleaves space as if it would get away from the earth, and longed for some other sphere—its sempiternal heritage. Its coignes of vantage ensnare the mind.

Now all this is seen in Europe when we study cathedrals, and compare them with the studied styles. One comes with this impression, and applies it to the opposite orders here. There is sufficient ground for the distinction and significance, or lack of it, in styles, if we compare the two churches named, which constantly catch the eye every time we cross the open spaces in Boston; and they force themselves upon the attention. The evening sky makes all beautiful. A radiant atmosphere spreads, and they all point into space, or lift themselves, with one common sentiment of serenity and adoration. In cooler moments we observe their excellences and defects. Campaniles have added a new feature to the city, and the Venitian architect has enriched it with the poetry of styles. It combines the repose of classic with the warmth of gothic or flowingness, the life and verticalness. All is curve, yet

it is playful, elegant, graceful and not thin. Balanced, it touches with sweetness and rhyme the prose of other orders. They seem cold beside it. Surely no other façades crowding a city ever held one as Venice does. One wanders in it as in an enchanting place, lifting itself above the water, as it does, where everything enriches by contrast, as if it had been created above the sea by the curve and impulse of its wave, restrained and fixed in laws of beauty as nature herself works. We are never tired there of the order. It is too beautiful to satiate, and it is elegantly distributed and changed. Infallible laws governed Gothic, as they did Greek, and both partook of nature at the source, each in its own kind. Every time one passes a Venetian front here, one is stirred, a strain comes over one, and the eye kindles, and the feeling is touched. This is the case when we come upon that angle by the common where the group of the Boylston house and the next building stands, and compare it with all other styles; or simply view a touch of the incomparable arch and grouping wherever it is applied, and used tolerably. Like Venetian painting, it was the sole creation of Venice, and it has never been surpassed. The wondrous city created two things, its architecture and its painting, and it left literature aside. It was like a radiant bridge from antiquity to the present time, impinging on the East. The works of Mr. Cummings, adapted here, not always equal, have planted this noble style, and they are the most imposing civic things in the city it seems to me.

Of Interiors: — They are ingenious and overcharged, as in literature Tennyson is oversweet, Browning overrough, Emerson overpithy. The great style has repose. *Le défaut de ses qualités*, as the French say. We are suffocated with bric-a-brac, tortured into picturesqueness. Gothic has been let loose in the house. We sigh for the

relief of older styles before mankind became graphic. Beautiful objects, beautiful ornaments should be kept in place. It is an *embarras* to have too much even of a good thing, to live in a museum. We cheapen all these things by heaping them, and displaying them. The eye is wearied, the taste surfeited. To live with such distractions is a mistake akin to being always in romantic spots, picturesque situations, the sublime, rough, wild or savage. It is not for constant contemplation. The mind wants simplicity to dwell with, and nature in her every-day, her morning gown. Grassy sweeps and turfy banks, trees, flowers, shrubbery, and quiet dells and nooks. It strains at the sublime and unusual, and is not always in a mood of the picturesque. On the Beverly shore I prefer the smooth places with roughness near. Nothing gives such quiet satisfaction as grass, lawns, shrubs, habitableness. A barberry bush is well enough, only not to live in. They pall upon us. They are not for every day, and at all hours. There is delightful invention, the architect, the decorator have all been at work. We are not left alone a moment. They are alive all about us. It is charming, what they have done to beguile monotony of its dulness, tameness of its insipidity, and to stimulate surprise. They besiege us, they must show off their hand. This will settle down at last to some recognized styles having unity and principle in them and repose. Now all is heterogeneous, one almost says, mongrel, hybrid—ornament at all hazards. The world never saw such a chaos. Whims are flying about like flies. Yet it is very delightful in parts, and the freshness and independence are hopeful.

Of Monuments in Boston, this may be said, the largest and most important is the cheapest commonplace. Borrowed from a poor and late clerical monument at Rome it worsens that. The figures are meagre, not monumental;

the ornament—eagles, bands, wreaths—of the stalest. It is a splendid position. What an opportunity lost! The surmounting figure cannot move for her clothes. The artist's Glover is better and alive, and has force, mastery. So the horticultural hall decorative statues are good, being adapted from antiquity. The other figures in the town are feeble enough, or tame—Sumner, Quincy, Webster, Everett. If Lincoln is better, the group lacks composition and design. The Washington monument is a tame-trotting, picture-book horse and man. There should be in all monuments a certain fire, force of character and inspiration. It is like writing an ode, you cannot fail, you are lost. If you attempt the heroic you must be equal to it. A monument is a lyric, a commemoration, a poem; there must be some touch of enthusiasm in it to make it a success. It is an ambitious effort. It strikes a high key, the art should respond. Simple representation and historic portrait, unless done with cunningest hand, will not do. The best things in this kind are the two statues, one of Sophocles and one unknown, in the Naples and Lateran museums, and the Demosthenes (casts are in the athenæum), and Frederick the Great at Berlin. These have that intense seizing of character with heroic feeling, like Titian's portraits. The same passion is lacking in this monument of Washington, that we miss in poetry here. Of Milton's three words, two are wanting, sensuous, passionate. The pedestal is thin. It has that fatal quality of commonplace. Yet it is vigorous in parts, far removed from vulgarity, and a dignified work. As to portrait statues, the worst I have seen, are the buckram men in bronze put up outside of Westminster Abbey. We cannot have genius every day, and sculpture is scarcely a living art in any representative or vital sense. It only deals in portraiture with any success. The command of the figure

is rare. Ward seems to have it, but he strikes us as lacking refinement and ideality. It is a good piece of work of his above the ether monument. Instructive it is to compare this monument with the one on the common; as instructive as the two churches are in sight from these points of view, the Arlington, the Berkeley street; in each case to show excellence or defect of style. The ether monument seems to want freedom, and is technical, as the other lacks all education and design. No one can pass the two churches without seeing the grace and feeling of the one, and the parody the other is of all grace and proportion. It simply mocks the gothic with ugly parallels.

Among the old things, are the wooden images, which used to be in Salem, elegant, rustic, graceful objects. One remains in the Derby house grounds nearly opposite the City Hall. These appear to have been Italian in sentiment, and are like much existing in Italy now, and which always has existed there since the Roman times, and the Greek and Etruscan before it. That country loves objects out of doors and against the air, and one said once there were more statues than men at Rome. They are dug up as we dig arrowheads here, the relics of the former inhabitants. There is iron work too, and excellent old fences of stately and ornamental design. These are the lost styles. They have a true interest as the old furniture has. How much they spoke to their time and represented it! How much elegance there was in them, refinement and taste! Stately often, imposing and chaste. Wainscoting, panels, cornice-work, beadings, majestic sweeping staircases, and landings like a palace, embayed windows, window seats, balusters, scrolled, of fairy lightness, and rails that curved, descended, crooked and twined upon them-

selves. In Mr. Peabody's house in Danvers, we cannot believe we are in this century. It is a bit of colonial England, and still transports us to the mother country. Later, style was lost utterly for fifty years.

There is good iron work down Central street, and in front of Dr. Cate's house. One fine fence remains by the Osgood house in South Salem. Posts remain elsewhere of beautiful design as at the Baldwin house. How important these things are, and what effect they have upon the imagination, especially upon childhood, let us measure by picture books. They are a living picture book. Micklefield's Indian, and the image over the Pickman house door, the wooden images on the Crowninshield farm in Danvers, and the grotesque carving over the engine house there, the carving on the upper common gate, the pine apple with its bright imitative color, the figures in the Derby-houses' grounds, and the carvings on Macintire's works,—slender in amount as they all were, were to a Salem boy forty years ago what St. Mary's Redcliffe was to Chatterton, they created him and enriched his imagination. Hawthorne need not have complained of Salem, nor James for him. Had he been born in Lynn, Lowell, or some other fiercely new American town, he never would have been Hawthorne. Essex county, out of the vortex, and from its old stock, history and wealth, has had more genius than any other county; and Salem at this hour with this Institute, and in some measure through it, has more the ripeness and tone of the old world,—maturity, ease, taste and comfort, and leisure and repose, and what they bring, — than any other town.

Boston now is getting filled with open air statues and monumental work, which, to the boy, will inspire him with historic suggestion and imaginative delight. Our hitherto bare life of the last half century is getting artistical.

Coincident with this disappearance of styles inside and out, was a decay of manners as a fine art. We shall have to study them anew. The younger sort have all their own way, the older are not seen.

A pretty style of house and ground was the old endwise house. Of these there were charming examples, Judge White's, Mr. Bancroft's, Dr. Prince's and many others. How sweet the grounds showed in front of them. They were frank, and let the public into all the family enjoyment and confidence. Many still remain, and they are among the distinctive features of old towns.

The Porches are among the sweetest bits we can see now, where they have not been altered or replaced, when they are sure to be ruined. Not one has been added in modern times that is not crude and shapeless. You might as well attempt to alter an old table or chair of the good periods, and give it another crook or design than what it has. The sense was lost, and we wandered in a sterile vacancy of design, and of heaviness and enrichment without beauty, both as to house fronts and porches, window headings, fences, roofs, doorways, and especially furniture, for fifty years. Two old brick houses interest one. One entertained Washington, (the late Mrs. Saunders remembered being in the cotillion with him there), the house of Dr. Fiske. Here the ground or base moulding told an architect the other day it was the same period as one of the early halls at Harvard College. The old Derby brick house in Derby street is more like a bit of old England than anything in the town. Beverly has charming bits. The refinement of the old manner, the educated ornament delights one precisely as old furniture does. It has an elegance, a chasteness, a sobriety, a salience and reserve, not being overloaded, a variety withal, that hold one by a kind of spell of interest and fascination. The horror of later things in wood had not arrived. We have been overrun

with the cheapest of quack styles, as the country generally has. It would not do to specify them. Upper Essex street, Federal street, Beverly, South Salem have much to show. The good house of Mr. Cox built early in this period and interregnum, Mr. Lee's, and one lately put up at the corner of Norman street, are a protest and relief. Certainly it is earnestly to be desired that we should do better in wood than we have done. Meantime, in this town, the old houses quiet the very feeling, and appeal pathetically against the intervening time. The house of Mr. W. H. Foster has charming steps in threes, and excellent old finishing touches, with extreme simplicity. One might enumerate many a refined bit and shy old house in Salem and Beverly. There is a noble one as you go to the cove, in the latter town, of square shape, ample dimensions and double porches, and where one is reconciled to white paint, and beside it a dear old veteran that wants to go into the ground, and has almost gone there, it is so old, and they both are expressive, to a degree that shames modern structure. They stand coquetting with each other and are monuments of centuries, impressive as time itself, and eloquent with character, and mass and sentiment. Hawthorne might write a romance about them. They are worth a whole modern town.

The Japanese, half-women in organization, have the sensibilities of Eastern races to color, and the harmony. Cashmere shawls, Chinese porcelain, illustrate this. An island like England, of about the size and population, on the edge of a great ocean, in the temperate zone, at the same distance from the equator on the other half of the globe, and bordering a continent; feudal too, with beautiful nature, and the same love of gardening, there is the same sensibility in their little art as in the English poets'. Their delicate feminine hands have a perfect manipulation.

Emerson says, in his Humble Bee

"All was picture as he passed."

This is true of the Japanese. They get a subject out of nothing. In a collection of ivories at the Burlington Club, there seemed an epitome of human life: nature feeling, art feeling, poetic feeling, the grotesque, gothic creativeness, the sentiment of Dutch pictures, incident,—a world in little, a Shakespearian range. We have only to examine fans to see their sensibilities to the impression. In my last talk with Mr. Hunt, I saw how much he was drawn to Japanese, and in the beautiful Gloucester harbor I think I see the influence of it. They have naturalistic feeling as the Greeks had design. They have changed ornamentation everywhere. A friend of mine, who has a collection gathered on the principle of poetic motive, tells me, he never takes a walk, but he sees grasses and weeds, and a hundred aspects of nature, Japanese have taught him. Whether this virginal island will now be destroyed for *naiveté* of motive and unspoilt feelings, remains to be seen. The Greeks when they lost their great art were conquered. The Japanese are springing on.

Since I was last here we have lost Mr. Very. A genius, as rare as Hawthorne, suddenly stopped in his early years. It is the quality of his work that transmits a man. The only analogue I can find for Very is Fra Angelico. No two men were ever purer-hearted, and so consecrated. It made their genius. Fra Angelico is worth whole ages afterward. Corot illustrates this. He outweighs the whole American landscape. Gray is the truest poet of the last century. How little he wrote! Very may remind us of Blake too. Spontaneity is the secret of genius. In Wendell Phillips' speeches, in Miss Preston's translation of Mirèio is this quality. It is as easy as breathing. The old diction is very threadbare.

Emerson in avoiding it rushes into the other extreme. It is an inspiration from temperament as Hunt's was. Fra Angelico was very limited, but he was divine. This golden thread of passion makes Parson's verse distinctive, and gives him grace—a quality we have not had. Religious poetry is usually valueless as literature. The didactic is not an inspiration in art. There are two or three notes of earnest poetry in New England by women. It is natural the genius of New England should take that turn, and that it should be through women. After fifty years who has grown? Shelley, because he lends you his soul to see with, and his art was equal. As the soul writes through Very, nature wrote through Shelley. If it is the west wind he writes about, the west wind writes it. If Very describes the columbine, its slender grace and tremulous nature are in the verse. He seems to me to be worth bushels of American poetry. When I was entering the bay and Dean Stanley was aboard, I pointed out Salem to him and told him I would give him the volume, now out of print, of his early poems; so I did when I got back to England. Mr. Very himself gave me the book with his name in it. Two days after we landed, Mr. Very was present at the hall. I crowded into the gallery at the last moment, and could see him on the floor of the house. I noticed his very intellectual head. There was no such head in the audience. So high and such fine lines. His things must grow. He is a quiet genius but unique, the least indebted, the most underived. American poetry is a dreary second-rate, it has struck out no new note. But such poetry, the pure effluence of the spirit, never can be popular, or even comprehended or felt by the many. I think of Daniels' lines quoted by Coleridge:

> "Unless, above himself, erect himself he can,
> How poor a thing is man!"

Note.— Rev. Jones Very died at his residence on Federal Street, Salem, on Saturday morning, May 8, 1880, after an illness of a fortnight.

He was the son of Capt. Jones and Lydia (Very) Very, and was born in Salem, Aug. 28, 1813. In 1823 and 4, he accompanied his father on the last two voyages of the latter to Europe. He graduated at Harvard University in the class of 1836, with high honors, and was a Greek tutor in that Institution in 1836–8.

The following extracts from two letters may appropriately be inserted in this connection. One from Mr. Very to Mr. Conrad incidentally gives a clew to his own college habits. He writes: —

"He (Chisholm) was a member with Thomas Barnard West, of Salem, and myself, of a small society for religious improvement, which held meetings once a week, during most of my college course. I remember these meetings with great satisfaction as hours well and properly spent; and I doubt not that they were so remembered by all who participated in them."

The other by one of his former pupils, received by the family on the day of his burial, shows the estimation in which he was held as an instructor, who writes: —

"You were my teacher of Greek in 1837–8, and your manner of instructing made a favorable impression on my mind, and produced a leaning to that language which still lasts. You were unwearied in drawing our attention to tenses and making us translate literally — two important points in learning languages of which however Mr. F * * * * * quite lost sight. The charm with which you surrounded Greek vanished from Harvard with you. You felt the spirit of the Greek people, and were ready to communicate it to such as had ears to hear." * * *

He studied for the ministry and was approbated as a preacher in 1843, though never ordained over a society or settled as a pastor, he had occasionally performed the clerical duties.

He had acquired distinction as a poet, especially as a writer of sonnets and occasional pieces, some of which were contributed to the papers and periodicals. In 1839 he published a volume of Essays and Poems, which has been considered a book of great merit. Griswold, in his Poets and Poetry of America, says, "His Essays are fine specimens of learned and sympathetic criticisms; and his sonnets and other pieces of verse are chaste, simple and poetical." His deceased brother, the Rev. Washington Very, and his sister, L. L. A. Very, shared his poetical talent.

He was of a quiet, reflecting and sedate turn of mind, and, though retiring, was very affable and companionable. He early gave himself up to a religious enthusiasm, which so possessed him that he left Cambridge and returned to Salem, where he had since lived in retire-

ment, writing sonnets when the mood seized him, but taking no part in public life.

The family is traced back to *Bridget Very*,[1] who came from England with her two sons and a daughter, and who was a member of the First Church in Salem in 1648. She and her son Samuel [2] lived on the north side of Cedar Pond, near the Danvers almshouse, where they owned a large tract of land, and where her descendants resided for a century or more. Many of them removed to Salem and became shipmasters.

In the first volume of the Historical Collections of the Institute, is an interesting account of a genealogical ramble by the subject of this notice. He says: "that it [the land] bore the name of the Very lot. I was shown by an aged man, the cellar where the first house stood. No house had been there since his recollection, but the stones were still there overrun with blackberry vines. There too was the well, covered now by a stone. A few old moss-covered apple trees in the midst of a new growth of oaks and pines showed where, two centuries ago, the strong hands and brave hearts of the early settlers had cleared the land and made them a home."

*Samuel Very*,[2] born in England about 1619, married Alice, dau. of John Woodis, Woodhouse or Woodice, had:

*Benjamin Very*,[3] married Jemima, dau. of Joseph Newhall, of Lynn; had:

*Isaac Very*,[4] born July 30, 1715; married Elizabeth Giles in 1736; a corporal under Col. Ichabod Plaisted in 1756; died at Sandy Hook in the army, 1778; had sons Isaac and Samuel.

*Samuel Very*,[5] born in Salem, Dec. 10, 1755; married in 1776, Hannah Putney. She died Feb. 4, 1799. He was a master and owner of a vessel, but kept a store many years in Salem at the corner of Essex and Boston streets; died in 1824, aged 69; had: Lydia, born June 14, 1792; married her cousin Jones Very, and was the mother of the subject of this notice.

*Isaac Very*,[5] born in Salem 1745; married for his 3d wife, Rachel Jones, of Charlton. He resided some years in Charlton and Spencer, the latter part of his life in Salem; was master of a vessel and an officer of the Customs, Salem. He died in 1831, aged 86; had:

*Jones Very*,[6] born in Spencer, Mass., Nov. 17, 1790, and followed the seas from early life. As a shipmaster he sailed in the employ of the Hon. William Gray from 1817 to 1821 in the Brig Concord; from 1821 to September, 1824 in the barque Aurelia. He married Feb. 13, 1813, his cousin Lydia Very, above mentioned. He resided at the corner of Essex and Boston streets, in Salem. He died Dec. 22, 1824.

[Ed.

## Regular Meeting, Monday, June 21, 1880.

Meeting this evening at 8 o'clock. The President in the chair. Records read. Donations and correspondence announced.

The President referred to the sudden and unexpected death of an associate member, Mr. Caleb Cooke, which occurred at his residence in this city on Saturday evening, June 5, 1880. His disease was typhoid fever, and it terminated fatally after a confinement to the house of a few days.

The President then alluded briefly to some incidents in the life of Mr. Cooke, his interest in scientific pursuits, his labors in the cause of science and general culture, and his acts of benevolence so freely and cheerfully done.

Mr. Cooke was the son of William and Mary (Fogg) Cooke, and was born in Salem, Feb'ry 5, 1836. His father was a mariner and for several years was an officer on board of vessels engaged in the West African trade, and died in California when the son was in his boyhood. He was educated in our public schools and commenced his active life, a clerk in the bookstore of the late Henry Whipple.

Continuing in that situation for a short time, he retired, and after spending about one year with Mr. George F. Read, in the study of the languages, especially the Latin, he devoted himself principally to the pursuit of Natural History which had long been his desire and inclination.

He was elected a resident member of the Essex Institute May 11, 1853, and was connected with that Institution until his decease, and for more than twenty-one years of this time he held some official position or a membership

on some important committee. For several years he was a pupil of Agassiz, and under his tuition pursued his studies with a class of young men who have since distinguished themselves in zoölogical and geological science.

In 1859 he went to Para, South America, and subsequently to Zanzibar and Madagascar; on the latter voyage, sailing in the barque Persia, from Salem, Nov. 5, 1860 and remaining for several years on the eastern coast of Africa, collecting specimens for the Museum of Comparative Zoölogy, Cambridge. He was compelled to leave this field of his labors on account of sickness from the African fever, but almost recovered his health during his passage home. While he was absent, Prof. Agassiz and Senator Sumner procured him the appointment of U. S. Consul at Mozambique, but the Commission passed him in transit and he never acted under it, although his name was borne upon the rolls for several years.

From the organization of the Peabody Academy of Science in 1867, until his death, he was an assistant, and one of the Curators of the Museum under its charge.

He was a member of the American Association for the Advancement of Science and also of the Boston Society of Natural History.

In 1875 he assisted Dr. G. M. Levette, of the State Geological Survey of Indiana, in a hydrographic survey of a dozen or more of the lakes in the northern part of that State, where his experience in the collecting and preservation of specimens of natural history, and in seining and dredging, was of great value.

He also became greatly interested in the work of the Salem Fraternity, organized in the spring of 1869, and was active in the establishment of its library and reading room, becoming chairman of the committees of those departments, and devoting himself constantly and earnestly to the welfare of that institution. He possessed many

admirable traits of character. No one was more ready to communicate information, or take more pains to confer a favor than he. He was a useful man in the line of his specialties.

Rev. E. B. Willson spoke in the highest terms of Mr. Cooke's labors in behalf of the Institute and of the Fraternity, and also of his many marked personal characteristics; frank, hating cant, impatient of conventionalities, sunny tempered by nature, but quick and of variable moods, he scorned wordy goodness, and called for deeds before his confidence was to be had. His valuable services in the management of the Salem Fraternity were particularly alluded to by Mr. Willson. Almost from the beginning his hand was in it, and as the zeal of others slackened, he only gave to it his more constant care. Every day he devoted hours to it, especially during the week-day evenings; these were the leisure hours from other pursuits which were his main business. His heart was in the work. Something new to be tried was always seething in his brain; more library room; more books; more periodicals, papers and pictures; another room for women, more workers on committees; more work for the workers; but he went first himself, and staid last. On the steady band of workers that has carried on the Salem Fraternity for these eleven years, his death falls like a momentary faintness which darkens the eyes to the way before them.

Mr. John Robinson spoke of the long personal friendship which had existed between Mr. Cooke and himself, and particularly dwelt upon his pleasant and kindly ways, always seeking to do a favor before it could be asked of him. He spoke of his fondness for children, and the ease with which he made them familiar with him, and related an incident which occurred only one week before Mr. Cooke's death.

It was customary every year for them to go to a certain choice locality where the Arethusa was particularly abundant, to collect the flowers and astonish their friends with a profusion of the blossoms of this beautiful and usually scarce plant. The trip was generally made on foot, but as the distance was nearly ten miles and it was desired to return before noon of the day selected, a carryall was obtained, an early start made, and two little girls taken to fill the spare seats. The flowers were found in great abundance and in a few hours the party were on their way home, Mr. Cooke and both little girls on the front seat. All the way the children were particularly merry, and Mr. Cooke merrier if possible than they. All sung, laughed, and drove by turns, and when nearly in town, it became necessary to quiet the fun lest it should too much surprise the sober passers-by. Mr. Cooke never was happier, and had not for two months seemed so well. The same Arethusas were not all faded the day he was laid in his grave.

Mr. Robinson spoke of the public loss caused by Mr. Cooke's death, and said that his long familiarity with the specimens and customs at the Museum of the Academy, would render it impossible to fill his place as he left it. But beyond this, Mr. Robinson said he felt the personal loss to be greater, for Mr. Cooke was one upon whom he always felt able to call at any and all times for favors or assistance of any sort, with the assurance of an immediate and cheerful response.

Dr. George A. Perkins said, that his personal recollections of Mr. Cooke were of the pleasantest kind, his eminent fitness for the position he was called to fill had often impressed itself upon him, and it would be safe to say that no specimen or specimens, in any of the collec-

tions of our scientific societies, escaped his memory or care, and all could be produced by him at a moment's notice. His uniform good nature under trying circumstances, and the pleasure he appeared to take in furnishing any desired information, made it exceedingly pleasant, to recall the memory of the visits, the speaker had made to the rooms of the Peabody Academy of Science, during the period of his official connection with that institution.

Mr. T. F. Hunt also made appropriate remarks regarding Mr. Cooke, his life and work, and on his motion

*Voted*, That the President, Rev. E. B. Willson, and Mr. John Robinson be appointed a Committee to prepare suitable resolutions on the death of Mr. Cooke—the same to be entered upon the Records of the Institute, and a copy to be sent to the family of the deceased.

The following Preamble and Resolution were reported by the committee, and recorded in conformity to the above vote:

*Whereas*, The recent sudden decease of an associate member, Mr. Caleb Cooke, who had been interested in scientific studies from his early youth, and an active member of the Institute since May, 1853, and for more than twenty-one years holding some official position or a membership on some important committee, requires from the Institute a grateful acknowledgment of his valuable services so cheerfully and freely given, at all times, in the promotion of the objects of its organization.

*Resolved*, That the Essex Institute desires to place upon record this testimonial of respect to the memory of its late associate, whose ardent zeal and indefatigable labors in scientific research, and especially in various acts of benevolence and general culture in this community, have secured the esteem and respect of all, and will cause his name to be long remembered in this, his native city.

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# NOTES ON THE FLORA OF ESSEX COUNTY, MASSACHUSETTS, WITH SKETCHES OF THE EARLY BOTANISTS, AND A LIST OF THE PUBLICATIONS ON THESE SUBJECTS.

BY JOHN ROBINSON.

Essex County offers to the botanist a field attractive and interesting in many ways. The open country, deep woods, and numerous swamps contain the usual number of species found in such localities, while a large river, the Merrimac, furnishes a valley in which grow many plants not elsewhere found in the county. There are upwards of fifty ponds, from four to four hundred acres in extent, rich in water plants and subaquatics. Though there is no considerable hill or mountainous district, it is sufficiently far north to have several representatives of higher latitudes and even a few alpine and sub-alpine species in the flora.

Along the seashore is found an abundance of plants peculiar to the region of salt-water marshes and beaches, while in the ocean and inlets grow about one hundred and

fifty species of algæ. These last named collecting grounds offer an opportunity to study, from fresh specimens, classes of plants from which the inland botanist is almost wholly debarred.

The land plants of the county belong decidedly to the northern flora although not so arctic in their character as the lichens and algæ. There is an almost total absence of many species common from Cape Cod southward and often found just south of Boston. In contrast to this the **Magnolia glauca** is still quite abundant at Gloucester, but not found again north of New Jersey. At Cape Ann is the southern limit of the little **Sagina nodosa**, and there also is found **Potentilla tridentata**, familiar at the Isle of Shoals and on Mt. Washington. Essex County seems also to be the southern limit, for this region, of **Pinus resinosa** (Red Pine), **Abies nigra** (Black Spruce), **Vaccinium Vitis-Idæa**, **Viola rotundifolia**, etc., as it is the northern limit of **Cupressus thyoides** (White Cedar), **Quercus prinoides** (Chinquapin Oak), **Polygonum Caryi**, **Draba Caroliniana**, **Lygodium palmatum** (Climbing Fern), and others. At Boxford is what has proved thus far to be the only New England station for **Salix candida**, and another bog willow, **Salix myrtilloides**, is occasionally met with. At Andover a locality for **Calamagrostis Pickeringii** was discovered in the summer of 1879; this species has only been known before at the White Mountains. Among the sedges and grasses, plants too frequently neglected will be found, many not heretofore supposed to grow in the county, and a careful comparison of this list with our botanies will show that the range of many species has been extended. Although much careful work has been done there yet remains much to be accomplished; for, besides the few species that may be added to the list of flowering plants, there are many species of lichens and

mosses not thus far collected, and the fungi and fresh-water algæ are purposely omitted altogether. The phanerogams and vascular cryptogams are quite fully studied, and to the Characeæ and marine algæ but comparatively few additions may be expected.

The early settlement of the county renders this a particularly favorable region for the observation of introduced plants. From the earliest settlement to the present time, foreign species have continued to arrive, many of which, like the early colonists, came with the evident intention of remaining; for, as the genista, barberry, white-weed and buttercups show, they flourish here and increase to an extent which it would be difficult for them to exceed elsewhere. The study of these introduced plants might be called historical botany and should not be confounded with the study of the natural distribution and changes of plants. The early colonists came to establish a home: they did not come for gold, diamonds, or lead even, and in coming severed old home-ties and connections. That the fruit and other vegetable productions of the new land were among the first things to which attention was given, the records of early writers amply testify. We are apt to consider the men of two hundred and fifty years ago as a stern company; yet, besides the fruits and plants which might possess economic or medicinal value, this latter use being ever uppermost in the minds of botanical explorers of that day, they did not overlook the curious or the beautiful.

The earlier accounts tell of the gardens that were almost immediately established upon the settlement of the country, and invoices of the articles to be sent to the colonists from the managers in Europe contain such things as the seeds of grains, stone fruits, quince, apple, pear, woadwax, barberry, etc. Besides these, living plants

must have been sent out from Europe, as is shown by the record of "Our Ancient Pear Trees" (Robert Manning in Proc. Am. Pom. Soc., 1875).

Some of these plants purposely introduced have failed to prove of use, or their time of usefulness has gone by, and they have been suffered to run wild, and at the same time a hundred others have like "stowaways" come uninvited. They have been introduced among the seeds of useful plants, in packing material, and as garden flowers. Many of the introduced species still remain restricted to certain localities, and others, although more widely disseminated, are in such situations as to make their origin self-evident, while others are so distributed as to appear to all intents and purposes as natives. Again, by the clearing of the forests, the general cultivation and changes in the condition of the soil, many native plants best able to endure the changes, or those to which the changes have proved beneficial, have been given positions of undue prominence in the flora; while other species, which at the time of the settlement of the country were much more abundant, have now become less numerous, or have entirely disappeared. It is a matter of considerable difficulty to picture to ourselves the country as it appeared two hundred and fifty years ago. It is probable that extensive forests reached to the ocean shore and, excepting the river marshes and clearings made by the fires of the aborigines, occupied the whole territory. The Indians cultivated corn, pumpkins, beans, tobacco and a few other plants. It is possible that some species of foreign plants had been introduced previous to the settlement by the whites through trade or by adventures, but this is uncertain. The study of the introduced plants is aided by the work of Mr. John Josselyn (New England Rarities Discovered), a reprint of which, with valuable notes by Professor Ed-

ward Tuckerman, is now available. Josselyn visited New England several times; when on the longest sojourn, 1663–1671, he landed at Boston and soon went to Black Point, Scarborough, Maine, where most of his observations were made. Josselyn was an excellent observer and although his writings are filled with the usual strange stories current in old works upon new and unexplored countries, they contain the first accounts of any consequence regarding the New England flora. This author did not, perhaps, make many observations in Essex County, yet his work contains but few species that do not grow here and its chief value consists in its arrangement and separation of the plants indigenous from the introduced weeds, thus giving what then appeared to be the plants which came with man or, as he called them, "Such plants as have sprung up since the English planted and kept cattle in New England." This, with the occasional observations by other writers, gives us a fair idea of what plants had established themselves here rather more than two hundred years ago. According to Professor Tuckerman, the next date by which the student may fix the introduction of foreign species is 1783, when the list of plants observed by Rev. Manasseh Cutler, of Ipswich, was published (Mem. Am. Acad. Vol. I). Since that date observations are more frequent and the more recently introduced species can be traced quite accurately. It is also quite probable that plants which at one time were quite common weeds have disappeared altogether. Dr. Cutler mentions the **Amarantus** known by the common name of "Prince's Feather" or "Love-lies-bleeding," as "amongst rubbish," but to the writer's knowledge it is never met with excepting in old-fashioned gardens. The **Hyoscyamus niger** and **Artemisia Absinthium** (Wormwood), spoken of by Dr. Cutler and other earlier writers as common in waste

places, are now very rare or unknown. The last mention of **Nicotina rustica** is by Dr. Osgood in 1853, but it is doubtful if he observed it as late as that; his observations were very probably made in previous years, and no one has since noticed it. The introduction of new manufactures is likely to bring with it plants which may be persistent enough in the region where they are introduced but unknown elsewhere. Such is the case at "Tapleyville," Danvers, where, in the vicinity of a carpet factory established forty years ago, are to be found several species of foreign plants unknown in any other town of the county, and perhaps not elsewhere established.

Two or three plants observed along the shore of the Merrimac river suggest a close connection with the mills at Lowell and Lawrence, one of them being a southern sedge. Many plants are emigrating eastward from our western states, travelling as it were by rail. The **Rudbeckia hirta**, now quite common in fields hereabouts, according to Dr. Pickering, did not reach Philadelphia until 1826, and this vicinity until perhaps 1855.

The latest arrival noticed (1878) is that of **Eleusine Indica**, a weedy, oriental grass which is common at New York city and Philadelphia. It has made its appearance along the railroad tracks at the Pennsylvania Pier, Salem, having travelled thence by the P. and R. R. R. Co's steamers, which regularly bring coal from Philadelphia. This last comes under the head of "ballast plants," a very full account of which may be found in the Torrey Bulletin for November, 1879.

## SKETCH OF SOME OF THE EARLY BOTANISTS.*

THE study of botany in Essex County, we may in fact say New England, dates from the time of Dr. Manasseh Cutler at the close of the last century. Previously the plants had only been noticed by writers upon more general subjects of natural history, or casually mentioned in letters written from this country to England. But from Cutler's time there has been a steady succession of botanists, chiefly amateurs, who have kept alive an interest in the subject, even at times making it the prominent topic considered at the literary and scientific societies and clubs of the region. It will only be attempted here to give a brief sketch of the older botanists who have contributed most to the knowledge of the subject in the county.

Francis Higginson, in a letter written from Salem in 1629–30 (Mass. Hist. Coll., I, 121), speaks of the plants which he had noticed growing in the vicinity, and mentions several species which probably now exist in the same localities as observed by him at that early date; one, the *Rubus odoratus* (Flowering Raspberry or Mulberry) still flourishes in the "Great Pastures," and the *Osmorrhiza longistylis* (Chervil or Sweet Cicely) has been noticed until very recently at "Paradise," near Salem.

William Wood, in the New England Prospect, speaks extendedly of the early gardens and the numerous useful plants native to the country, mentioning what he saw at Ipswich, Salem, Marblehead, etc.; Parkinson and Jerard

*The writer is indebted to Dr. Henry Wheatland for his assistance in obtaining notices of the early botanists of the county, chiefly from the Proceedings and Historical Collections of the Essex Institute, from which a large portion of this sketch is made.

enumerate New England plants; John Josselyn, previously referred to, gives an account of the native and introduced species; and other early writers, including John Winthrop, speak of the excellent quality of the native fruits and the beauty of the flowers, particularly dwelling on the superiority and abundance of the wild strawberries.

None of these can, however, be spoken of or claimed as Essex County botanists, and it is not until after the close of the American Revolution that we find any serious or scientific study of the plants of the county.

Dr. Manasseh Cutler was born at Killingly, Connecticut, May 3, 1742, graduated at Yale College in 1765, afterward studied law, and was admitted to the bar in 1767. He soon studied for the ministry and was settled at the Hamlet Parish in Ipswich, which was set apart from that town and named Hamilton for Alexander Hamilton whom Dr. Cutler greatly admired. He served as a chaplain during the war of the revolution and on his return studied medicine which he afterwards practised among his parishioners. The efforts of Dr. Cutler secured the passage, in 1787, of the famous ordinance by which freedom was declared in the northwestern territories and he soon after organized the first band of pioneers that emigrated from the east to Ohio. The next year he followed them driving himself the entire distance in a sulky, being accompanied by a few friends. Upon his return from the west, or in 1800, he was chosen to represent old Essex in Congress where he served two terms. While in Philadelphia in 1787, he visited at the house of Benjamin Franklin, and afterward wrote an account of the great statesman which was considered as one of the best, being copied by Sparks in his life of Franklin. Dr. Cutler prepared, in 1783, "An account of some of the vegetable

productions, naturally growing in this part of America, botanically arranged," which was published in the first volume of the Memoirs of the American Academy of Arts and Sciences in 1785. He here described some three hundred and fifty species of flowering plants suggesting several points which have been followed by later botanists. It was Dr. Cutler's intention to extend this work, and there are in existence several manuscript volumes which he prepared toward this end. These valuable manuscripts are in the possession of Prof. Edward Tuckerman, who intends that their final destination shall be the library of Harvard; and it is to be hoped that they may at some future day be printed, with such notes as would be required to make them of use to the present generation of botanical students. Dr. Cutler's death occurred in 1823, after more than fifty years' service in one parish. He has been called the father of American botany, a term certainly appropriate for the times and for this region, where his mantle fell on the shoulders of Osgood, Nichols, Oakes, and Pickering.

Dr. George Osgood, son of George and Elizabeth (Otis) Osgood, was born at Fair Haven, March 25, 1784. He studied medicine with his father and settled in Danvers in 1804, where he had for many years an extensive practice. Dr. Osgood acquired, by his association with Cutler, Nichols and Oakes, a taste for and knowledge of botany which lasted him through life. He contributed to Dr. Bigelow much valuable information while the latter was preparing his "Florula Bostoniensis," and in 1853 published in the Salem Observer a local list of flowering plants. He died May 26, 1863.

Dr. Andrew Nichols was born in the rural part of Danvers, Nov. 22, 1785. He was the son of Andrew and Eunice (Nichols) Nichols, and studied medicine under

Dr. Waterhouse, settling in that part of Danvers, now Peabody, in 1808, where he practised successfully, remaining there until his death, March 31, 1853.

He was particularly interested in the local natural history of this region, and in 1816 delivered a series of lectures on botany, the first of such in this part of the country. Dr. Nichols was one of the founders of the Essex County Natural History Society and its president, retaining unabated till death his interest in his favorite study.

William Oakes must be acknowledged as the most eminent botanist of Essex County birth. He was the son of Caleb Oakes and was born at Danvers, July 1, 1799. He was educated at Harvard receiving the degree of A. B. in 1820. He early developed a taste for natural history relinquishing the practice of law, his chosen profession, to study this branch of science.

Mr. Oakes' work was chiefly in New England, collecting extensively in Essex County, Mass., Vermont, the White Mountain region, and southeastern and western Massachusetts. He prepared the list of plants of Vermont for Thompson's history of that state; and his work at the White Mountains was so thorough that recent collectors, with all the advantages of improved roads and easy access to every portion of that region, have failed to add but few to the number of species which he discovered there. It was his intention to have published a flora of New England, but was deterred by the appearance of Beck's Botany. He afterwards became deeply interested in a work, with illustrations by Sprague, upon White Mountain scenery, which was published in 1848; but not until after his death which occurred July 31, 1848, the preface of the work having been written July 26, only five days previous.

Mr. Oakes was impulsive and generous; thoroughly in

earnest in his favorite study, he seriously impaired his fortune to carry out his schemes more perfectly. Like many other men of note, he was hardly appreciated while living, but no monument which could have been erected would have made his memory more cherished or his worth more appreciated by the present generation of botanists than that which he left behind,— an extensive collection of most beautifully prepared botanical specimens, with an identification absolutely correct, besides many valuable notes and observations. Prof. Tuckerman dedicated to him a pretty little plant common in the region of Plymouth, but it afterwards had to be transferred to another genus; and now for the first time in any flora, it becomes a pleasant duty to give by its name, "Oakesia," the little bellwort, a common Essex County plant, which Prof. Watson of Cambridge has found necessary to separate from the genus to which it has heretofore been referred in his revision of the family Liliaceæ, and has feelingly dedicated to the memory of William Oakes.

Dr. Charles Pickering, son of Timothy and Lurena (Cole) Pickering and grandson of Col. Timothy Pickering of revolutionary fame, was born at Starucca Creek on the Susquehanna, Pennsylvania, in 1805. He was educated at Harvard in the class of 1823, graduating at the medical school in 1826. In 1838 he was appointed naturalist to the U. S. (Wilkes) Exploring Expedition; and to perfect his knowledge of animals and plants in foreign parts, he made very extensive journeys after his return from that expedition. He was the author of several works of great value which in their preparation required much untiring research; among them are "Geographical distribution of Animals and Plants" and "Chronological History of Plants," the latter work occupying the last sixteen years of his life in its preparation.

During his college life Dr. Pickering spent much of his time at Wenham, at the homestead of his grandfather, Col. Pickering, and here he was in the habit of botanizing in company with William Oakes, a favorite locality being the "Great Swamp." It is but right that Essex County should claim a share of the honor of his name, for it was here that his attention was drawn to botany, and in the Chronological History of Plants, page 1063, we find the following entry "1824 * * In this year, after an excursion in 1823, with William Oakes diverting my attention from entomology, my first botanical discovery." Dr. Pickering died at Boston, March 17, 1878. The writer will always remember with pleasure and gratitude the many hours spent with Dr. Pickering during 1876 and '77, while he patiently sought out, among his early manuscript notes and his letters from William Oakes, the species and stations noticed while botanizing in Essex County more than fifty years before.

Rev. John Lewis Russell, son of John and Eunice (Hunt) Russell, was born at Salem, Dec. 2, 1808. He was at Harvard in the class of 1828, and graduated at the divinity school in 1831. After occupying pulpits in Chelmsford, Hingham, Brattleboro, Kennebunk and various other places, he returned in 1853 to Salem, where he resided, preaching occasionally, until his death June 7, 1873.

Mr. Russell was particularly devoted to cryptogamic botany, publishing accounts of his investigations from time to time as he proceeded, besides many popular articles on various families of plants. He lectured frequently on botany and was for many years vice-president of the Essex Institute.

Mr. Russell contributed much to the general knowledge of botany in Essex County, but his most extensive collections were made in other places.

The only attempt at an enumeration of county plants, as such, is that of Mr. Cyrus M. Tracy, of Lynn. It was intended to give a list of the flowering plants found in that region and contained 546 species. Besides possessing a very happy gift as a botanical lecturer, Mr. Tracy has contributed several valuable articles upon local botany to the publications of the Essex Institute and elsewhere.

Mr. Geo. D. Phippen, of Salem, whose notes on the native plants have materially aided the writer, has often presented the subject of botany at meetings of the Institute, and has written several articles of interest upon the subjects which have been published in various places. Mrs. C. N. S. Horner, of Georgetown, a most excellent botanical collector, published a list of the plants of that region in the Georgetown Advocate in 1876. Mr. Calvin Pool, of Rockport, prepared a somewhat smaller list of plants of Cape Ann, which was published in "Pigeon Cove and vicinity" in 1873. Mr. S. B. Buttrick, of Salem, whose years do not diminish his interest in botany, and who is ever on the alert to find some rare flower, has contributed several lists of plants to the earlier numbers of the Proceedings and Bulletin of the Essex Institute, as also have Dr. G. A. Perkins, of Salem, chairman of the botanical section of the Peabody Academy of Science, Mr. George F. H. Markoe, formerly of Salem, now of Boston, Rev. Ariel P. Chute, formerly of Lynnfield, and many others. Dr. Henry Wheatland, although not claiming to be a botanist, has often aided those who did, by his assistance in revising their articles for the publications of the Institute while acting as the editor. Mr. S. P. Fowler, of Danvers, one of the older botanists and a companion of Oakes and Osgood, in many rambles, has made frequent observations regarding the trees and shrubs, and has cultivated extensively many

of our native plants. Of those who have contributed to swell the list of known county species of plants and who have not published any writings on the subject, it will be impossible to speak separately. They must be content to feel that they have aided the cause of botanical knowledge as they certainly have, and are deserving their share of credit for so doing. There are many who have collected and prepared specimens which will always serve as pleasant reminders of their work. Among such are Mr. B. D. Greene, who added several plants to the flora from near Tewksbury; Mr. Wm. P. Richardson and Mr. S. Bass, who botanized near Salem; and more recently Mrs. Alex. Bray, Mrs. Charles Grover, Mrs. J. Babson and Mrs. Davis, who have added many species to the list of Cape Ann Algæ; Mr. Frank Lufkin of Pigeon Cove, who has noticed many plants new to that region; Mr. John H. Sears, of Danvers, whose specialty, the forest trees, has been the means of bringing together at the Museum of the Peabody Academy of Science one of the best local collections of native woods in any museum; Mr. W. P. Conant, who has added many species of Cyperaceæ and Gramineæ and a rare Botrychium to the flora; besides many others whose names will appear in the list associated with the plant which they have been fortunate to discover.

To those whose assistance either by their writings, by specimens contributed, or who have rendered any assistance by information or other attention, the writer desires to express his warmest thanks. It would be impossible for him to specify those who have aided him or their manner of so doing, and he can only thank all collectively which he does most sincerely.

## Publications in which notices of interest relating to the Botanists or the Plants of the County may be found.

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Memoirs of the American Academy of Arts and Sciences, Vol. I. Boston, 1785. Cutler's List of Plants.

Bigelow's Florula Bostoniensis, 1st, 2nd and 3d editions.

Catalogue of Animals and Plants of Massachusetts in Hitchcock's Report on the Geology, etc., of Massachusetts, 1833.

Gray's Manual, 1st, 4th and 5th editions.

Gray's Flora of North America. Part I.

Essex Institute Proceedings, Bulletin, and Historical Collections.

American Naturalist, Botanical department.

Emerson's Trees and Shrubs of Massachusetts.

Tuckerman's Josselyn's New England's Rarities Discovered.

Transactions of Am. Antiq. Society, Vol. IV.

Tracy's Flora of Lynn, etc.

Pickering's Chronological History of Plants.

Watson's Revision of the Liliaceæ in Proc. Am. Acad. Arts and Sciences. Vol. XIV.

Watson's Bibliographical Index to N. A. Botany.

DeCandolle's Prodromus (occasional reference to Oakes).

Eaton's Ferns of North America.

Harvey's Nereis Boreali-Americana.

Farlow's List of Marine Algæ of U. S. in Rept. Fish Com., 1875, and Proc. Am. Acad. of Arts and Sciences. Vol. X.

Flint's Grasses and Forage Plants.

Transactions of the Mass. Hort. Soc.

History of the Mass. Hort. Soc.

Oakes' Catalogue of Vermont Plants in Thompson's History of Vermont. Pages 173–208.

Halsted's Characeæ in Proc. Bost. Soc. Nat. Hist. Vol. XX.

List of the Plants of Georgetown and Vicinity, by Mrs. Horner, in Georgetown Advocate, 1876.

List of Plants near Danvers, by Dr. Geo. Osgood, in Salem Observer, 1853.

Hovey's Magazine of Horticulture (various articles by Oakes and Russell).

List of Plants of Pigeon Cove, by Calvin Pool, in "Pigeon Cove and Vicinity."

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These notes are introductory to an Enumeration of the Plants of Essex County that has been prepared, after a careful examination of the work of the earlier botanists and diligent search in almost every portion of the county for species not previously noticed, and will appear in a separate issue, as an occasional publication of the Institute.

With so few persons devoting themselves to the study of botany or the collection of speci-

mens, particularly of the lower orders of plants, it would be impossible to present an absolutely complete list, and perhaps with even the greatest facilities no one has succeeded in so doing for any region.

Almost the only extended collection of dried specimens of county plants were those of the late Mr. Oakes, so that there really exists no very great foundation upon which to build, other than the herbarium recently collected, and the writings of the more reliable among the earlier botanists, who for nearly a century have now and then appeared upon the scene.

Of the plants enumerated, almost all are represented in the herbarium of the Peabody Academy of Science at Salem, and where the species has not been collected and its occurrence is only known by the testimony of some writer, it is so stated in the list.

Several errors have been detected in early local lists and corrected, and such notes added to the paper as seem of interest locally or otherwise.

The writer would express his indebtedness to Prof. Asa Gray, Prof. G. L. Goodale and Prof. Sereno Watson, for their numerous kindnesses and assistance rendered him during the past five years while preparing this flora, and also to Messrs. Edwin and Charles E. Faxon for their kindness in revising the final proofs.

## Field Meeting at the Willows, Salem Neck, Tuesday, June 22, 1880.

The two hundred and fiftieth anniversary of the arrival of John Winthrop, at Salem, with the charter and records of the Massachusetts Bay Company, occurring on June 22, 1880, it was deemed meet and appropriate that the first field meeting of the season should be held on that day, at the Pavilion on Salem Neck, from which is obtained an extensive view of the bay, and of the shore along which the fleet sailed ere the anchors were dropped in the waters of New England; and that the exercises of the occasion, instead of a discussion on subjects of general scientific and historical interest, should be devoted to a recital of incidents connected with this important event, or such other topics as the time and place might suggest.

A description of the appearance of Salem harbor, at this early period in our history, may be gleaned from the following extracts from the diary of Rev. Francis Higginson, who, under date of "Fryday, June 26, 1629," writes: "The sea was abundantly stored with rockweed and yellow flowers like gillyflowers. By noon we were within 3 leagues of Capan, and as we sayled along the coast we saw every hill and dale, and every island full of gay woods and high trees. The nearer we came to the shoare the more flowers in abundance, sometymes scattered abroad, sometymes joyned in sheets 9 or 10 yards long, which we supposed to be brought from the low meadows by the tyde. Now what with fine woods and greene trees by land, and their yellow flowers paynting the sea, made us all desirous to see our new paradise of New England, whence we saw such forerunning signals of fer-

tilitie afarre off."[1] On Monday, June 29, 1629, he writes: "we passed the curious and difficult entrance into the large and spacious harbour of Naimkecke, and as we passed along it was wonderful to behould so many islands replenished with thicke wood and high trees and many fayre green pastures."[2]

The appearance of this shore, so pleasantly described by Mr. Higginson, has undergone great changes since his day, and more especially during the past thirty or forty years. It is now included within the limits of Beverly, Manchester, and Gloucester, and is a much frequented and very delightful summer resort, many of the wealthiest and most prominent families of the country, including merchants, bankers, artists, professional men and persons of leisure from the great cities, making this their summer home.

The fragrant pine woods, the oaks, the birches, and the green fields come down even to the beaches, to the rocks, and to the seaweed, and mingle the freshness of the country with the ocean breezes. The elegant villas, with their quaint architecture, dot the coast, and enliven the dark green of the woods with their red roofs. Every secluded cove has its favorite yacht; the beaches are hard and smooth, and the shouts and laughter of the bathers mingle harmoniously with the rote of the surf, and the hoary cliffs of primitive rock extend into the sea, scarred, wrinkled and worn.

The belt of woods extending parallel to the coast, diversified with ponds, rivulets, rocky hills and meadows, the

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[1] Mr. Higginson arrived near midsummer; at this period of the year, great numbers of jelly-fishes (the *Cyanea arctica*, *Aurelia flavidula*, and other species) are observed on the surface of the water near the coast. Possibly specimens of these animals, some having the resemblance of flowers, may have attracted the notice of the voyager, and have thus been mentioned in his journal.

[2] See Hutchinson's Collection of Papers, pages 41 and 44.

habitat of many rare floral gems (of which may be specified the *Magnolia glauca*, a representative of a more southern flora, and the *Linnea borealis*, that of the alpine), affords many picturesque views and delightful rural by-paths and lanes, adding much to the attractions of this pleasant summer retreat.

The Pavilion is located on or near the six acres of land granted by the town of Salem, to Rev. John Higginson in 1661. This land he conveyed by deed (Reg. Deeds, Essex, vol. iii, fol. 396), 25, 9, 1670, to Thomas Savage, who on August 6, 1675, transferred the same by deed of gift to his daughter Sarah and her husband, John Higginson, jr., with lands adjoining which he had purchased of other parties, in all about twenty-eight acres (Reg. Deeds, Essex, vol. iv, fol. 383).

A grandson of John Higginson, jr., the fourth John Higginson[3] in succession (the four were living at the period from the birth of the youngest Jan. 10, 1697–8, to the death of the eldest in Dec. 9, 1708) conveyed this estate April 8, 1730, to Benj. Ives[4] (see Reg. Deeds, Essex, vol. lv, fol. 92).

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[3] Rev. John Higginson, born at Claybrook, Aug. 6, 1616, came with his father to Salem in 1629, and in 1641 assisted Rev. Henry Whitfield (whose daughter Sarah he married) in the ministry at Guilford, Conn. He returned to Salem in 1659 and was ordained as pastor of the church, which his father had founded some thirty years before, and continued the respected minister until his death Dec. 9, 1708.

II *John* born at Guilford, 1646, a merchant, settled in Salem; Lieut. Col. of the regiment, a member of the Governor's council, etc., died March 23, 1719.

III *John* born Aug. 20, 1675, educated a merchant, lived in Salem, died April 26, 1718.

IV *John* born Jan. 10, 1697–8, graduated at Harvard College, 1717; sustained chief offices of the town, County Register, etc.; died July 15, 1744.

For a sketch of this family see Hist. Coll. Essex Inst., vol. V, p. 33.

[4] Benjamin Ives was the son of Thomas and Elizabeth (Metcalf) Ives, and was baptized at the First Church, Aug. 9, 1702. He md. Anna, dau. of Roger Derby, and in 1715 bought of the family of Thomas Beadle deceased, the estate now bounded by Essex, Pleasant, and East streets. He became a prominent merchant of his time and bought much real estate in Salem. Capt. Ives died in the prime of life, in the full tide of a prosperous career, about July, 1752.

After the death of Benjamin Ives in 1752, the estate with additional purchases, including land obtained from the town by vote of the citizens, in exchange for Pignal's[5] or Roache's Point, on which is located the present almshouse, amounting to forty acres, and also land from Abbot,[6] 16 Aug., 1738 (Reg. Deeds, Essex, vol. lxxiv, fol. 176), passed into the possession of his son John Ives, who conveyed the same to Richard Derby[7] May 16, 1758 (see Reg. Deeds, Essex, vol. cxliv, fol. 40).

After the death of Richard Derby this property was assigned to John Derby towards his portion of his father's estate, who conveyed the same by deed to Edward Allen, Dec. 13, 1793 (see Reg. Deeds, Essex, vol. clvii, fol. 73). After the death of Edward Allen, July 27, 1803, and of his wife Margaret, Aug. 13, 1808, this estate passed into the possession of his son Edward Allen, who sold the same to Josiah Orne, Feb. 26, 1810 (see Reg. Deeds, Essex, vol., clxxxviii, fol. 177). Josiah Orne, April 6, 1816, conveyed the same to Jonathan Dustin of Danvers (see Reg. Deeds, Essex, ccx, fol. 86). Eliza Sutton, Hazen Ayer and Serena his wife, in her own right, all of Peabody, being heirs of the late Jonathan Dustin,

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[5] This name appears in deeds, but it should be "Picton" named for Thomas Picton to whom the land was originally granted. Sometimes spelled Pigden.

[6] The following Deposition from the State Records probably refers to the same person:—John Abbot of Salem, Shoreman, aged seventy years, testifyeth and deposeth that during my acquaintance of many years with Mr. Philip English of Salem who is now a Prisoner in the said Town Gaol, I have heard him the said English declare that he was bred & born in the Communion of the Church of England, and that he would go to no other publick worship willingly, & if he had opportunity to go to a Church agreeable to which when the Church was erected at Marblehead he the said English & I have gone frequently thither together from that time down to this, & further there lying a ferry between this Town & Marblehead over which the ferryman could by no means be prevailed upon to carry us every Lord's day, he, the said English, has several times spoke to me to be partner with him in a Boat that we might go thither constantly to Church.

Salem, Feb. 29: 1724–5.

[7] For a sketch of the Derby Family, see Hist. Coll., Essex Inst., vol. III, pp. 154, 201, 283.

conveyed the same to Daniel B. Gardner, jr., of Salem, Sept. 24, 1875 (Reg. Deeds, Essex, vol. dccccxli, fol. 233), who had the land surveyed, streets and avenues laid out, and many lots sold, upon which have been built a large number of seaside cottages.

In 1876, the streets and avenues were constructed. In 1877, the Naumkeag Street Railway Company extended its tracks from the junction of Essex and Webb streets to the Willows. Cars went over the road June 9, of that year — on the following day it was opened for the public travel. Parties interested in the railroad bought land of Mr. Gardner, June 19, 1878 (Reg. Deeds, Essex, vol. m, fol. 204), and during the following spring and early summer erected the Pavilion (the place of meeting), which was opened to the public on the 17th of June. This building contains on the lower floor a refreshment saloon, a large hall 35 by 80 feet, with anterooms attached — on the second floor, a large dining hall and kitchen, with small private dining rooms. The tower has rooms in several stories, and above the balcony, is a camera obscura, giving an extensive marine view, including the adjacent shores and the islands in the harbor. During the present season the Coliseum, a large circular building, has been erected for entertainments and public meetings — the grounds have been enlarged by the purchase of Mr. Gardner, of additional land adjoining, March 4, 1880 (Reg. Deeds, Essex, vol. mxxxii, fol. 246), and very much improved by the planting of shrubbery, ornamental trees, and flowering plants, making paths, fountains, etc. Additional improvements are in contemplation the coming season.

This portion of the neck has been known in the past as "The Higginson Farm," "The Allen Farm," and more recently "The Juniper." Some years since, there was a

large group of juniper trees, but for several years they have been gradually decaying — a few yet linger among the cottages, so few that one would hardly conjecture that this place derived its name from their presence. Hospital Point and the land adjoining on the northern boundary of the above, owned by the city, was set apart by an order of the city council, adopted May 9, 1859, "to be kept open and dedicated as a Public Square for the use of the inhabitants of Salem forever, under such regulations as the council shall from time to time establish." This place has been known as "The Willows," from a double row of willows planted about the beginning of the present century, under the direction of Capt. Israel Williams.

On the 8th of July, 1878, an ordinance was passed by the council, and approved by the mayor on the day following, for "Ball Playing," assigning for this purpose a piece of land enclosed as a part of the "Poor Farm," lying west of "The Willows" so called, and running west and including the rising ground to the western line of the fort. On this land trees of various kinds have been set out, and these grounds will probably be opened to the public at no distant day.

During the forenoon, an opportunity was afforded, to those interested in our early history, of visiting the various places of interest, and of recalling some of the old landmarks that are now rapidly disappearing under the hands of modern improvement. On Winter Island and other places near by, buildings were erected, wharves constructed, and vessels built for the purpose of carrying on the fisheries which flourished from an early period to 1735, when it was entirely discontinued in this locality, and now scarcely a vestige of this former occupancy and industry remains.

Previous to 1714, Winter Island was owned by the

commoners (except a narrow strip on the northeastern end which was attached to the Higginson farm), and was leased to various individuals — after the vote of 1714, it came into possession of the town and was used as a pasture with the neck, after the discontinuance of the fisheries until 1824, when it was transferred to the Poor Farm. In 1863, it was ceded to the United States government for coast defences.

In 1870, the Secretary of War permitted the Trustees of the Plummer Farm School for boys to establish their institution there, and the city conveyed to the same parties whatever interest it might have in the premises.

This institution was founded by Miss Caroline Plummer of Salem, who died May 15, 1854, and is intended for the instruction, employment, and reformation of juvenile offenders in the city of Salem. The residue of her estate, after the payment of other bequests and debts, was appropriated to this purpose. Sum received, $25,462.23; the Trustees are appointed by the mayor and aldermen, and are incorporated by an act of the legislature, passed May 21, 1855. First meeting of the Trustees was held Nov. 26, 1855, when by-laws were adopted and officers elected. The present building was finished for occupancy May 20, 1870. The city government appropriated $8,000 for this object. Charles A. Johnson was appointed the superintendent, and now holds the office. First boy was admitted Sept. 1, 1870 — the present number is thirty. The present amount of invested funds is $50,000.

The traditional site of Clifford's tavern was on the left of the road just after passing the causeway. The Town Records (vol. for 1659–1680, page 306) inform us that "at a meeting of the selectmen, Nov. 25, 1679, the selectmen consent unto and approve of Serg$^{t}$ Jno. Clifford to keepe a victualling house att Winter Island."

In 1805, the question of the town's right to sell this island was introduced at a town meeting, and a committee, consisting of Joseph Story (afterwards Justice U. S. Sup. Court) and others, was directed to report on the subject — the report was favorable and was submitted at a meeting held Aug. 12 (see Salem Gaz., Aug. 16–20, 1805), and was not accepted. Samuel Putnam (afterwards a Judge Mass. Sup. Court) expressed views in opposition, and it is intimated that Wm. Prescott entertained similar opinions.

Some fifty years afterwards the subject of selling Winter Island was again agitated and referred by the city council to the city solicitor for his opinion (see Report on the sale of the Neck Lands, communicated to the city council, Dec. 27, 1858, by W. C. Endicott, the city solicitor (now Judge Mass. Sup. Court).

This document, in addition to the legal opinions therein expressed, contains a history of the Neck Lands, in particular, and notices of the commoners' grants, the circstances under which they were made, the policy pursued by them at that period, and also the town's connection with these lands. It is well known that all the lands in this vicinity were originally held by the commoners, the proprietors of lands lying in common and undivided. At meetings held in 1713 and 1714, votes were passed, granting to the town, the roads, the burial places, the neck, the common, and other unappropriated lands, lying within the body of the town. Grants were also made to the poor for a pasture under the care of the selectmen, and to the ministry in the several parishes, also, that all the common lands be measured and divided among the commoners, according to the number of cottage rights each one held. Several distinct proprietaries were formed under an act of the legislature, The Great Pasture, Sheep Pasture, etc. Scarcely a vestige now exists of this old custom of holding lands in common. In this

connection, reference may be made to a Report on "The common lands of the city of Salem," prepared by Hon. C. W. Upham, during his mayoralty, and printed in the Reports for the financial year 1852.

Several forts and breastworks have from time to time been built, but only two now remain, Fort Lee on the highlands of the Neck, and Fort Pickering on Winter Island. According to tradition, Fort Lee was originally planned by Gen. Charles Lee, who gave instructions regarding its construction, and that it be designated by his name. Charles Lee was a major general in the Revolutionary army, born at Dernhall, Cheshire, England, in 1731, died at Philadelphia, 2 Oct., 1782. He accompanied Washington to Cambridge, where he took command of the army 3 July, 1775; at this time he was employed with others in arranging for the defence of the harbors along this coast.

Fort Pickering was built soon after the settlement; frequent allusions are found in our Records. In 1699, it was called Fort William, sometimes Fort Ann. Oct. 30, 1799, the name was changed by order of the war department to Fort Pickering, in honor of T. Pickering of Salem, a member of Washington's military family during the war, and of his cabinet during his presidency. It has been several times put in order, when war was pending, mounted with cannons and garrisoned with troops; on the return of peace, the guns were removed and the troops disbanded.[8]

Perhaps the most interesting of these earthworks, because now threatened with obliteration at no distant day, though still easily traced, is the one at the Juniper.

There seems to have been an old block house there in 1758. Barracks had been erected there, April 22, 1776,

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[8] See Hist. Coll. Essex Inst., vol. V.

and in 1787, Juniper's battery is named in a report of the French engineer, Rochefontaine, who was then examining the fortifications of New England. At this period, the old forts seem to have been much frequented by children from the east end of the town, who resorted there for games of props and wrestling, and on holidays found cakes and other articles of refreshment for sale there. (See Hist. Coll. Essex Inst., vol. VI, p. 85.)

Another incident of interest is preserved in the "famous records" kept at the barber's shop of Benjamin Blanchard on Essex, opposite Cambridge street; in which records, local events were entered from day to day, by the eminent patrons of that resort. An entry under date of Jan'y 17, 1809, reads as follows:

"Col. Lee, Collector of Customs, at the head of about seventy men, went to the Hospital on the Juniper, to prevent the Embargo laws from being violated. It was suspected a vessel belonging in Beverly would sail that evening." The suspected craft did not sail that evening, but escaped the Collector's vigilance a night or two after, and it was said that her Federalist owners, as a blind, claimed that she had been run away with, and advertised a reward for information which would convict any unauthorized persons of having taken possession of her. The Hospital at the Juniper was established in 1792(?) and was destroyed by fire on the 16th of October, 1846, and the playground which the boys of Salem selected a century ago is now a place of wholesome recreation for the southern half of Essex County.

The inspiration of the occasion was not wholly in the memories of the past, but bright sunlight, refreshing breezes, the lovely green of the shore and the deep blue of the bay, dotted with the white sails of many yachts, engaged in their annual regatta that morning, added

much to the enjoyment of the large number who participated in the celebration.

At 1 P. M. lunch was served in the dining hall; at 2.30 o'clock the afternoon session was held in the hall below. The President in the chair.

The PRESIDENT introduced, in brief and appropriate words, Robert S. Rantoul, Esq., who delivered the address which is printed in the Historical Collections of the Institute, Vol. XVI, Part 3, with the other exercises of the meeting, consisting of a poem written by Miss Lucy Larcom, and read by Rev. De Witt S. Clark, of the Tabernacle Church, Salem; remarks from Col. T. W. Higginson of Cambridge, Hon. G. Washington Warren of Boston, Hon. G. B. Loring of Salem, Hon. H. K. Oliver, mayor of the city, Seth Low, Esq., of New York City; letters were read by Rev. E. S. Atwood of the South Church, Salem, from Hon. Chas. Levi Woodbury of Boston, John G. Whittier of Danvers, Hon. Robert Chas. Winthrop of Boston, Hon. Leverett Saltonstall of Newton, Prof. A. P. Peabody of Cambridge, and Hon. Marshall P. Wilder of Dorchester. The exercises appropriately closed with the reading by Rev. George H. Hosmer, of the East Church, Salem, of a communication, prepared by Stanley Waters, an associate member, giving a succinct account of the life of Rev. William Bentley, D. D., a former minister of that church, a distinguished antiquarian and historical scholar, and well known for his attainments in philology and general literature; this gathering also commemorates his birth-day. He was born in Boston, June 22, 1759. The paper also contains a narration (found among Dr. Bentley's papers) of a drive of Benjamin Ward, in company with his grandfather, Miles Ward, about the town, in 1760.

# *A List of the Birds of the Hudson Highlands, with Annotations.*

By Edgar A. Mearns.

[Continued from page 25, Vol. XII.]

## Family, CORVIDÆ.

**102. Corvus frugivorus** (*Bartram*). Common Crow. A permanent resident; breeds.

Crows are partially migratory; and whether those that breed here are permanent residents, or are replaced in winter by individuals which breed farther north, is a mooted question; the latter hypothesis seems most probable, however. There is a regular spring and fall migration, when they move in immense flocks. On the evening of December 5, 1876, I saw a flock that almost rivalled an historic flock of Wild Pigeons. The Crows were flying southward, and settling in an evergreen wood beside the Hudson. I immediately started towards the spot, and, as I neared it, they all arose. The flock that I saw alight at first was but a small fraction of the entire number that then rose into the air; there were thousands of them. Save the loud, rushing sound produced by their flight, which sounded like the roar of a large waterfall, they were nearly silent. As they circled overhead, a few caws, like words of command from chosen officers, were heard; but the rank and file uttered no sound. Soon they alighted again in a deciduous forest not far distant, only to be again alarmed at something and take to flight; but they finally settled near the same place for the night, without a caw or a wing-flap to indicate the whereabouts of that sable army of usually garrulous birds. These migratory flocks begin to appear in October, and continue until the commencement of winter. In February, flocks are seen passing northward.

There is a mountain in the Highlands, on the east side of the Hudson, where, late in summer, thousands of Crows come nightly to roost in the cedars; all come from the east, and I do not think that any of our resident Crows join their camp.

Crows are expert fishers. In winter, they watch at the fissures in the ice along shore, at low tide, and claw out whatever fishes are passing. I have known two Crows to capture upwards of twenty good-sized gold fishes (*Crassius auratus*) in less than an hour's time.

Crows usually begin to build early in April. Mating begins in March, when they are more noisy and less shy, than at other times. The eggs, as a rule, are deposited from the middle of April to the middle of May. A nest was found on April 14, 1873, containing six eggs; another on May 24, 1873, with four fresh eggs. Their complement varies from four to seven. The old birds are very assiduous in the care of their young; the latter make a great outcry while being fed; the mother may often be seen flying in circles about the nest, talking to the little ones, and modulating her voice whimsically.

Crows eat the eggs of other birds. I caught one in the act of destroying those of the Night Heron (*Nyctiardea grisea nævia*). He came silently and stealthily into the swamp, but my shot cut short his rapacious career just as he was about to indulge his gluttonous appetite at such great cost to the poor Herons, and he tumbled ingloriously into the mud.

*Dimensions.*— Average measurements of six males: length, 19·30; stretch, 37·70; wing, 12·18; tail, 7·52; culmen, 1·92; gape, 2·22; tarsus, 2·40; middle toe, 1·51; middle toe and its claw, 1·98. Average measurements of six females: length, 18·60; stretch, 36·05; wing, 11·82; tail, 7·12; culmen, 1·76; gape, 2·02; tarsus, 2·28; middle toe, 1·38; middle toe and its claw, 1·85. Measurements of largest male (No. 234, ♂ ad., October 8, 1874, Highland Falls, N. Y., E. A. M.): length, 19·75; stretch, 39·00; wing, 13·31; tail, 8·06; culmen, 1·96; gape, 2·26; tarsus, 2 40; middle toe and its claw, 1·98. Measurements of smallest female (No. 2,011, ♀ ad., March 13, 1880, Highland Falls, N. Y., E. A. M.): length, 18·10; stretch, 34·50; wing, 10·85; tail, 6 85; culmen, 1·73; gape, 1·98; tarsus, 2·27; middle toe and its claw, 1 80.

**103. Corvus ossifragus** (*Wilson*). Fish Crow. Occasional upon the Hudson River. Observed from Riverdale to Cornwall.

I recorded its capture at Highland Falls, in the Bulletin of the Nuttall Ornithological Club (Vol. III, No. 1, pp. 45–46, for January, 1878), on the 7th of May, 1877, when I shot a female specimen. I have come across but one other Fish Crow on the Hudson River. On May 1, 1880, at Cornwall, I heard a note several times repeated, which I recognized as that of the Fish Crow. Afterwards, one flew towards me and passed quite near, so that I had a distinct view of it; its note, at the same time, was unmistakable, but I had no gun with me to make assurance doubly sure.

Mr. Eugene P. Bicknell, the only other observer who has noted this Crow upon our river, writes as follows:[1] "As will be seen from the following remarks, there is no doubt that a pair of these birds have

[1] Bulletin of the Nuttall Ornithological Club, Vol. III, No. 3, p. 131, July, 1878.

been in the vicinity during the past season. I first noticed them on February 24, being attracted by their small size, and for several weeks thereafter they were often seen, their peculiarities of note and habit at once distinguishing them from the common Crow. Their favorite resort seems to be a growth of tall and partially decayed locusts bordering a fresh-water pond, and on two of these trees standing together, somewhat apart from the others, the birds were to be found almost every morning, but, owing to their shyness and the openness of the ground, I was unable to approach within gunshot. In alighting, they usually chose the very topmost branches of the trees, and when approached manifested their suspicion by a restless and excited motion of the wings, which appeared to be more pointed than in the more stoutly built *C. Americanus*. Their note was an abrupt, expressionless croak, usually delivered singly and at regular intervals. Though other Crows were often seen in the vicinity, this pair kept aloof by themselves, and several times I saw them chased by a clamorous party of their larger relatives. Latterly, they have been rarely noticed, and then always singly, thus indicating that they are breeding in the vicinity."

In 1844, De Kay first gave the Fish Crows as inhabitants of New York State, observing[2] that "they are occasionally seen on the shores of Long Island, but are generally confounded with the Common Crow." His statement was not, until quite recently, fully substantiated, and has been quite generally discredited by writers. Mr. Clarence H. Eagle set the matter at rest, however, by publishing (in the Bulletin of the Nuttall Ornithological Club, Vol. III, No. 1, p. 47, for January, 1878) the following notice of its capture: "On the 17th of July, 1873, I shot a fine female of this species near Rockaway, L. I. The bird was flying around, but kept apart from a flock of Common Crows in the vicinity." Mr. Theodore Roosevelt furnished the next record of its capture on Long Island (Notes on some of the Birds of Oyster Bay, L. I., March, 1879). He says: "Dec. 30, 1874, I shot a male. There was then a good deal of snow on the ground. It was by itself, although the Common Crows were assembled in great flocks." Messrs. Louis A. Zerega and H. A. Purdie (see Bulletin N. O. C., Vol. V, No. 4, pp. 205 to 208, and 240, October, 1880) have recently thrown much light upon the northern distribution of this species, and it is now established to be a regularly breeding summer resident on Staten Island, where Mr. H. A. Wheeler has observed it from March to November, and observes that during the past five years he has always found it breeding on Staten Island, but seldom finds more than half a dozen nests in a season, if as many as that.

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[2] New York Zoölogy, Part II, p. 135, 1844.

Mr. De L. Berier does not regard it as rare on Long Island. Mr. Zerega has found it to be a common permanent resident along the shore of Sandy Hook Bay and at Seabright, N. J., and infers that it breeds in those places.

I found a large flock of Fish Crows near Garden City, Long Island, N. Y., on October 29, 1880. There were others straggling about, but not associating with the Common Crows, which were also abundant.

*Dimensions.*— Measurements of No. 1,360, ♀ ad., May 7, 1876, Highland Falls, N. Y., E. A. M.: length, 16·00; stretch, 33·20; wing, 10·84; tail, 6·20; culmen, 1·37; gape, 1·65; tarsus, 1·85; middle toe, 1·30; its claw, ·47.

**104. Cyanocitta cristata** (*Linné*). Blue Jay. A permanent resident; breeds. Large flocks move north in spring, and south in autumn.

*Dimensions.*—Average measurements of fourteen specimens: length, 11·74; stretch, 16·77; wing, 5·14; tail, 5·19; culmen, 1·09; gape, 1·20; bill from nostril, ·71; tarsus, 1·39; middle toe, ·79; its claw, 36. Average of eight males: length, 11·92; stretch, 16·96; wing, 5·23; tail, 5·27; culmen, 1·08; gape, 1·19; bill from nostril, ·70; tarsus, 1·45. Average of six females: length, 11·63; stretch, 16·66; wing, 5·08; tail, 5·14; culmen, 1·09; gape, 1·21; bill from nostril, ·72; tarsus, 1·38; middle toe, ·79; its claw, ·36.

## Family, TYRANNIDÆ.

**105. Tyrannus carolinensis** (*Linné*). Kingbird; Bee-martin. A common summer resident; breeds. Arrives during the first half of May (4, 1872; 14, 1873; 11, 1874; 9, 1875; 8, 1876; 13, 1877; 1, 1878; 9, 1879; 8, 1880), and remains until September.

*Dimensions.*— Average measurements of eleven specimens: length, 8·51; stretch, 14·61; wing, 4·64; tail, 3·55; culmen, ·74; bill from nostril, ·55; gape, ·98; tarsus, ·75; middle toe, ·57; its claw, ·28.

**106. Myiarchus crinitus** (*Linné*). Great-crested Flycatcher. A common migrant, and rather abundant summer resident; breeds. Arrives in May (22, 1874, 16, 1875; 13, 1876; 23, 1877; 3, 1878; 9, 1879; 8, 1880), and stays till about the end of September (24, 1873; 19, 1875).

Great-crested Flycatchers are extremely pugnacious. I once shot one that was fighting with another of its species, and seemed to be a veteran warrior, for his rectrices were reduced to a single one, while his general appearance reminded me of that of a dissipated tom-cat. My shot only wounded it, and it flew upwards in a spiral, and then slowly descended to the ground in the same manner, screaming and snapping its bill, the whole distance. When I started to secure it, it

flew directly at me, biting, snapping its bill, and uttering piercing screams.

*Dimensions.*— Average measurements of six specimens: length, 9·01; stretch, 13·49; wing, 4·14; tail, 3·75; bill from nostril, ·62; culmen, ·77; gape, 1·09; tarsus, ·84; middle toe, ·50; its claw, ·26.

**107. Sayornis fuscus** (*Gmelin*). Phœbe-bird; Pewee Flycatcher. A common summer resident; breeds. Arrives early in March (17, 1871; 26, 1872; 19, 1873; 21, 1874; 29, 1875; 28, 1876 [26, de Nottbeck at Fishkill]; 26, 1877; 13, 1878; 13, 1879; 2, 1880), and remains until about the first of November (October 15, 1874; 23, 1876; 26, 1879). I have found its nest completed by April 10 (1880). In 1878, its full complement of eggs was laid April 20, and the first egg of their second brood was deposited on May 20th. A pair for several years built their nest in a shaft of an iron mine, in a dark and extremely humid situation; this nest contained no less than six eggs, on May 3, 1880.

*Dimensions.*—Average measurements of fourteen specimens: length, 6·99; stretch, 11·03; wing, 3·38; tail, 2·89; bill from nostril, ·41; culmen, ·60; gape, ·75; tarsus, ·67; middle toe and its claw, ·59; toe alone, ·40.

**108. Contopus borealis** (*Swainson*). Olive-sided Flycatcher. A common spring and fall migrant. Arrives late in May, and passes through before June (May 25 to 28, 1876; 25 to 29, 1877; 16 to 25, 1878; 9, 1879); seen in autumn from the 27th of August to the 18th of September (August 27 to September 18, 1875; September 5 to 15, 1876; September 1, 1879).

I first saw the Olive-sided Flycatcher in September, 1872, when I surprised several of them that were engaged in their favorite pastime of plucking each other in mid-air, amidst a din of screams and vituperations, and settled their quarrel by summarily disposing of two of the belligerents in my basket. Since then, I have found it nearly every spring and autumn, and frequently, during the latter season, in considerable numbers. In spring, when it is rather scarce, it is usually seen singly, or in pairs, perched upon a dry limb on top of some tall tree, sitting remarkably erect, with its crest raised. It is frequently very wild, and hard to shoot.

*Dimensions.*—Average measurements of five specimens: length, 7·39; stretch, 12·68; wing, 4·05; tail, 2·70; bill from nostril, ·54; gape, ·97; tarsus, ·60; middle toe, ·46; middle toe and its claw, ·70.

**109. Contopus virens** (*Linné*). Wood Pewee. A common summer resident; breeds. Arrives from the South about the middle of May (12, 1873; 12, 1874; 11, 1875; 19, 1876; 17, 1877; 20, 1878; 14, 1879; 13, 1880), and takes its departure late in September (21, 1874; 14, 1876; 11, 1880).

*Dimensions.*—Average measurements of eight specimens: length, 6·53; stretch, 10·61; wing, 3·34; tail, 2·62; bill from nostril, ·42; culmen, ·65; gape, ·83; tarsus, ·50; middle toe, ·32; middle toe and its claw, ·48.

**110. Empidonax pusillus traillii** (*Audubon*). Traill's Flycatcher. A rather uncommon spring and fall migrant, and occasional in summer; probably breeds.

This active, noisy species is usually present during the latter part of May (12 to 31, 1875; 22 to 28, 1876; 25, 1878; 13, 1880), and passes south in autumn. Messrs. Roosevelt and Minot found it summering in the Adirondacks, in Franklin County, N. Y.[3] Dr. Thomas M. Brewer described its eggs (Proceedings of the United States National Museum, p. 4, April 29, 1879) taken in Catskill mountains, N. Y., by Dr. James C. Merrill.

*Dimensions.*— Average measurements of three adult males: length, 6·09; stretch, 9·36; wing, 2·87; tail, 2·33; bill from nostril, ·35; gape, ·70; tarsus, ·66; middle toe and its claw, ·58; toe alone, ·42.

**111. Empidonax minimus** (*Baird*). Least Flycatcher. A very common summer resident; breeds. Reaches us from the South about the beginning of May (15, 1874; 10, 1875; 8, 1876; 7, 1877; 2, 1878; April 29, 1879, 26, 1880), and departs during the last of September and first part of October (latest observation October 8, 1874).

*Dimensions.*—Average measurements of twelve specimens: length, 5·41; stretch, 8·15; wing, 2·51; tail, 2·21; bill from nostril, ·31; gape, ·65; tarsus, ·65; middle toe and its claw, ·49; toe alone, ·32.

**112. Empidonax flaviventris** (*Baird*). Yellow-bellied Flycatcher. A common spring and fall migrant. Arrives early in May, and passes on before June (May 9, 1873; 31, 1875; 23 to 28, 1876; 17, 1877; 22, 1878; 14, 1879; 13, 1880). In autumn, passes south during September (latest observation September 28, 1875).

*Dimensions.*— Average measurements of seven specimens: length, 5·63; stretch, 8·70; wing, 2·65; tail, 2·16; tarsus, ·59.

## Family, CAPRIMULGIDÆ.

**113. Caprimulgus vociferus** (*Wilson*). Whippoorwill. A very common summer resident; breeds. Reaches us from the South about the beginning of May (April 23, 1872; May 6, 1873; 12, 1874; 10, 1875; 11, 1876; April 27, 1877; 24, 1878; May 4, 1879; April 22, 1880), and departs during September. My latest date is September 30, 1875, when I procured a female specimen. In 1878, its notes were heard during September, as late as the 23d. Its cry is not as

[3] The Summer Birds of the Adirondacks, in Franklin County, N. Y., No. "61," 1877.

frequently heard after the beginning of August, as during the early part of summer.

I append the following note from my journal: "May 14, 1877. This evening I approached a wall behind which a pair of Whippoor-wills were crying; every minute they would fly out after insects, in small circles, immediately continuing their notes on settling again, so that scarcely any interruption was perceptible. Between each *whip-poor-will*, they uttered a cavernous *chuck* as usual, and then a low, guttural hollow *caw-ca-ca ca-ca — hic-hic-hic — ca-ca-tic*, etc. These ludicrous sounds, probably their love notes, were uttered in a low, hollow tone. I shot the male, at which the female flew close up to me, then removed a short distance, and commenced a loud *whip-poor-will* in seemingly a joyous tone; but this is probably their one way of expressing every strong emotion."

*Dimensions.*— Average measurements of seven specimens: length, 9·75; stretch, 18·60; wing, 6·08; tail, 4·65; culmen, ·37; bill from nostril, ·30; gape, 1·34; tarsus, ·70; middle toe, ·64; its claw, ·24.

**114. Chordeiles popetue** (*Vieillot*). Nighthawk. A rather common summer resident; breeds. Arrives towards the end of April (May 12, 1872; April 14, 1873; May 15, 1875; 18, 1877; April 27, 1878; 18, 1879; May 3, 1880), and departs late in September (October 3, 1874; September 15, 1875; 15, 1876). Large flocks pass through during migrations.

*Dimensions.*— Measurements of No. 681, ♀ ad., May 17, 1875, E. A. M.: length, 10·00; stretch, 24·00; wing, 7·88; tail, 4·80; culmen, ·25; tarsus, ·55.

## Family, CYPSELIDÆ.

**115. Chætura pelagica** (*Linné*). Chimney Swift; "Chimney Swallow." An abundant summer resident; breeds. Arrives about the end of April (28, 1872; May 6, 1873; 8, 1874; 3, 1875; 6, 1876; April 26, 1877; 28, 1878; May 4, 1879; April 27, 1880), and departs the last of September (30, 1877; 28, 1878; 29, 1879; 18, 1880).

Chimney Swifts begin to build during the last week of May, when they may be seen breaking off the small, dry twigs with which they build their nests, while on wing. The eggs are laid early in June. During migrations they associate in large flocks, roosting in some large, high chimney. They retire just at dusk, dropping down chimney very much as Rails settle into the grass.

*Dimensions.*— Average measurements of thirteen specimens: length, 5·43; stretch, 12·46; wing, 4·94; tail, 1·90; bill from nostril, ·15; gape, ·59; tarsus, ·49; middle toe, ·29; middle toe and its claw, ·45; claw alone, ·22.

Family, **TROCHILIDÆ.**

**116. Trochilus colubris,** (*Linné*). Ruby-throated Humming-bird. A common summer resident; breeds. Arrives early in May (2, 1872; 11, 1873; 10, 1874; 11, 1875; 6, 1876; 12, 1877; 4, 1878), and departs in September (29, 1874; 20, 1876; 25, 1880).

Our Humming-bird is fond of visiting the marshes along the Hudson. The bulrush-tops are sometimes used to line its nest with; and the flowers growing there are a great attraction. It is a very fierce little creature when angered. I have seen one attack a pair of Downy Woodpeckers upon the tree which it had chosen for its nest, and drive them off, exhibiting the utmost rage. Once I saw one dart furiously at a small red balloon which a boy was flying in a field. It often alights on telegraph wires.

*Dimensions.*—Average measurements of six specimens: length, 3·74; stretch, 4·12; wing, 1·54; tail, 1·15; culmen, ·67; gape ·80; tarsus, ·18; middle toe and claw, ·24.

Family, **ALCEDINIDÆ.**

**117. Ceryle alcyon** (*Linné*). Belted Kingfisher. A common summer resident; breeds. Arrives in March (26, 1872; 31, 1873; 18, 1874; April 2, 1875; 11, 1876; March 26, 1878; April 9, 1879; 5, 1880), and stays till late in November (4, 1874; 30, 1878). It probably occurs on the lower part of the river in winter.

*Dimensions.*—Average measurements of fourteen specimens: length, 13·02; stretch, 22·16; wing, 6·17; tail, 3·60; bill from nostril, 1·85; gape, 2·92; tarsus, ·42; middle toe, ·59; its claw, ·38.

Family, **CUCULIDÆ.**

**118. Coccyzus erythrophthalmus** (*Wilson*). Black-billed Cuckoo. A very common summer resident; breeds plentifully. Arrives in May (13, 1874; 20, 1875; 20, 1876; 13, 1877; 4, 1878; 9, 1879; April 26, 1880), and stays through September (25, 1874; 16, 1879).

It begins nesting in May. The young are covered with curious-looking pin-feathers, which gives them an appearance like that of the wire swab used in gun-cleaning. The old bird is a close sitter, and, when obliged to leave its nest, moves off slowly upon the branches, with wings and tail outspread. Sometimes it will come quite close to the observer, and then utter for several minutes a low, mournful *coo, coo, coo, coo*, and then an outpouring of harsh, loud notes that quickly bring the mate to its side, all the while keeping its wings and tail ex-

panded, and crouching low upon the branch. Its ordinary notes are quite commonly heard at night as well as during the day.

*Dimensions.*—Average measurements of nine specimens: length, 11·83; stretch, 16·55; wing, 5·50; tail, 6·26; bill from nostril, ·74; gape, 1·27; tarsus, 1·02; middle toe, ·79; middle toe and its claw, 1·06.

**119. Coccyzus americanus** (*Linné*). Yellow-billed Cuckoo. A summer resident; breeds; much less numerous than the Black-billed Cuckoo. Arrives early in May (14, 1876; 6, 1878; 10, 1880), and stays until late in September (23, 1874).

*Dimensions.*—Average measurements of four female specimens: length, 12·20; stretch, 17·04; wing, 5·70; tail, 6·20; bill from nostril, ·76; gape, 1·31; tarsus, 1·10.

## Family, PICIDÆ.

**120. Picus villosus** (*Linné*). Hairy Woodpecker. A permanent resident; sometimes abundant; breeds, but not plentifully. A nest which I found on Consook Island, in the Hudson River, on May 5, 1878, was built in a natural cavity in a small tree, about four feet from the ground, and contrary to Hairy's usual habit, it was warmly built of grass and strips of bark, whereas the eggs are commonly deposited right on the chips, without any attempt at a nest. The entrance was through a knot-hole, and neither it nor the interior had been enlarged by the birds. The nest rested on a mass of decayed black muck at the bottom of the hole.

*Dimensions.*—Average measurements of twelve specimens: length, 9·40; stretch, 15·66; wing, 4·78; tail, 3·30; culmen, 1·22; bill from nostril, 1·00; gape, 1·32; tarsus, ·84; middle toe, ·57; its claw, ·40.

**121. Picus pubescens** (*Linné*). Downy Woodpecker. A permanent resident; abundant; breeds.

The Downy Woodpeckers, though always abundant, are especially so during the first warm days of spring-time, when they become almost gregarious, and are apparently on the move northward. Their full complement of eggs is usually deposited during the first two weeks of May, although I have found their eggs as late as May 30 (1876).

Downy is a very active, industrious bird, and perhaps this is the reason why he experiences no special discomfort from cold during the bleak winter season. At night he is comfortably housed in a hole, which he digs expressly for that purpose. What a knowing cove he is! Always, so far as my experience goes, he places the entrance to his burrow so as to face the sunny south. Though Downy is a wanderer like the rest of his tribe, yet, whenever he takes a journey into a far

country, his first labor is to construct a home wherein to spend the cold, dark night. I have often watched him at work, and have found that he is apt to remain for several days in the vicinity of his burrow. Let me give a chapter of Downy's history, copied from my note-book: I first saw him at half-past four o'clock, on the afternoon of February 20, 1878. At that time he had burrowed a very little way into a pear-tree — just made a beginning — at a height of about four feet from the ground. When I returned, in less than a couple of hours, he had entirely disappeared from view, except when he came to the top of his mine, and dropped the chips which resulted from his labors down below. When I visited the place by daylight, I found a smoothly-finished cavity such as is used for the purpose of nidification, and the ground covered with chips, but no Downy was in sight. Shortly after sunset I again visited the nest, and found him snugly ensconced within the cavity, with his bill warmly tucked away amongst the feathers, which latter were ruffed up so as to look like a black and white ball, with a red-napped head tucked in the middle. While sleeping, his whole frame heaved at every breath, so profound was his slumber. I summoned a friend to come and see my Woodpecker: after watching him a while, our voices awoke him, when he flew swiftly out, and lit upon a pear-tree close by, whence, after a lapse of five minutes, during which time he remained perfectly motionless, he returned to the burrow.

March 1st, I visited Downy at 5.50 o'clock A. M., and found him still sleeping soundly, although the Bluebirds were already singing, and the Crows flying in flocks overhead. I waited for one hour to find out his time of rising. At 6.50 o'clock, I heard an admonitory tapping upon the inside of the tree — a waking-up process analogous to our bathing and dressing, doubtless. A moment later, his head appeared at the entrance to his burrow, whence, after a jerky salutation to the first sunrise of spring, he hied him forth to his day's toil. At first, he lit on a pear-tree near by, tapped sleepily at the branch, ascended to the top of it, looked curiously at me, and then took a long flight over into the woods, where I soon heard his loud notes. *Downy is not an early riser!* On March 3d, I made the following note: "This evening at half-past five o'clock, I visited the Downy Woodpecker, and found him sound asleep in his hole, clinging to the side of the cavity, with head thrown over to one side and nestling amongst the feathers, showing conspicuously the crimson feathers of the nape. The feathers of the breast were deeply creased down the middle. As my warm breath reached him, his chest stopped heaving, and, with a swiftness that was astonishing as contrasted with his previous deep slumber, he threw out his neck and head, but, as I instantly retired, he did not leave the burrow, nor, probably, find out

what had awakened him. He retires to the burrow every evening at sunset, or sooner. On March 6th, I noted: "A female Bluebird was worrying and making a great disturbance about the Downy's hole, which she, apparently, had occupied during the day, but which he had again appropriated to sleep in. All of the Snowbirds in the neighborhood had assembled, and were contributing to the fracas all that they were able in the way of din; meanwhile, *Picus* looked out of the circular entrance to his house, collected and calm, but flew away at my approach to the woods and did not return till late.

*Dimensions.*—Average measurements of twenty-nine specimens: length, 6·83; stretch, 11·98; wing, 3·70; tail, 2·53; culmen, ·68; gape, ·79; tarsus, ·65; middle toe and its claw, ·60.

**122. Sphyrapicus varius** (*Linné*). Yellow-bellied Woodpecker. Resident, except during the summer months; abundant during spring and fall migrations, but rarer in winter.

This handsome Woodpecker is frequently seen in our forests and orchards. Like most of its family, it possesses a variety of notes, one of which resembles the common cry of the Blue Jay. Mr. Peter de Nottbeck informed me that he has frequently found it during autumn, eating the corn in the fields; it was while thus feeding that he usually secured his specimens. Early in October, 1880, I saw these birds migrating along the beach, at Great South Bay, Long Island, in large numbers. Sometimes they lit on the low pines, or even on the ground. They were passing westward in straggling flocks which were almost constantly in view.

*Dimensions.*—Average measurements of nineteen specimens: length, 8·56; stretch, 15·37; wing, 4·87; tail, 3·20; culmen, ·92; gape, 1·07; tarsus, ·78; middle toe and its claw, ·85.

**123. Centurus carolinus** (*Linné*). Red-bellied Woodpecker. Occasionally found in summer. I recorded (in the Bulletin of the Nuttall Club, Vol. III, No. 3, p. 146, 1878) the capture of a specimen at Cornwall, on the Hudson, in September, 1870. A second specimen was shot at Cold Spring, on the Hudson, by Mr. Francis Butterfass.

**124. Melanerpes erythrocephalus** (*Linné*). Red-headed Woodpecker. Occurs during spring and fall, and more rarely in winter. Not known to breed in the Highlands, but breeds commonly a little to the west of them. Occasionally, the young are quite numerous in autumn; but the species is rarely met with at other seasons.

*Dimensions.*—Average measurements of nine specimens: length, 9·75; stretch, 17·90; wing, 5·52; tail, 3·30; culmen, 1·17; gape, 1·37; tarsus, ·87; middle toe, ·72; its claw, ·39.

**125. Colaptes auratus** (*Linné*). Golden-winged Woodpecker. Flicker; High-hole. A permanent resident, but of irregular occurrence, and generally rare in winter; breeds plentifully. Arrives in

full force during March; has its first brood on wing by the middle of June; departs before December, excepting those which spend the winter north.

*Dimensions.*—Average measurements of fifteen specimens: length, 12·60; stretch, 20·75; wing, 6·25; tail, 4·63; culmen, 1·42; gape, 1·57; tarsus, 1·14; middle toe, ·87; middle toe and its claw, 1·27.

## Family, **STRIGIDÆ.**

**126. Bubo virginianus** (*Gmelin*). Great Horned Owl; "Hoot Owl." A permanent resident; breeds. Have heard its notes at midday, in cloudy weather.

*Dimensions.*—Average measurements of two male specimens: length, 21·44; stretch, 53·88; wing, 14·48; tail, 8·63; culmen, measured from frontal feathers, 1·55; from cere, 1·10; tarsus (about), 2·30; middle toe, 2·00; its claw, 1·12.

**127. Scops asio** (*Linné*). Screech Owl; Mottled Owl. A permanent resident; abundant; breeds.

On May 30, 1875, I found a Screech Owl's nest in the hollow bole of a buttonwood-tree, about fifteen feet from the ground. On thrusting my hand into the cavity, it was instantly seized by the old bird, which I drew out of the hole and flung away from me with the utmost dispatch, without reflecting that I was allowing an interesting specimen to escape; but I removed one of the younglings, and afterward captured both of the parents, which were in the gray plumage, as were their three young. Two of the young were kept all summer as pets, and were allowed perfect freedom; towards autumn they left the place, but one of them was found in the woods and brought back, but soon left us again; they were never heard of afterwards. The parent birds were shot at night. On my first nocturnal visit, both birds flew close about my ears, and uttered a curious, deep, guttural sound, like one of the notes of the Black-billed Cuckoo (*Coccyzus erythrophthalmus*); sometimes they darted with great swiftness close to my head, and snapped their bills sharply as they passed. I killed the female, and shot the male on the following night, when I was assailed in the same manner as on the previous evening.

On the following season, a pair of Golden-winged Woodpeckers (*Colaptes auratus*) took possession of the owl-tree, and held it until the spring of 1879, when I was again attacked by a pair of Screech Owls, when walking past the tree one dark night. On examination, a single young bird, and an addled egg, were found in the tree; the latter was, of course, appropriated on the spot. The old birds snapped their bills as usual, but also uttered an indescribable cry which was new to me. A few days later, I visited the nest in the day-

time, and captured the female in the hole along with the young one. After a prolonged search, the male was descried sitting in the crotch of a white-oak tree, in the midst of a clump of branchlets; his "ears" were very conspicuous, and his neck fully extended, as he attempted to obtain a better view of me. Both parents were red; but the young one was gray, like those obtained from the same tree four years previously.

The red, and gray-plumaged birds are about equally numerous. Some specimens are intermediate.

*Dimensions.*— Average measurements of nine specimens: length, 9·40; stretch, 23·61: wing, 6·40; tail, 3·09; culmen, ·63; gape, ·98; tarsus, 1·54; middle toe, 1·80; its claw, ·48.

**128. Asio americanus** (*Stephens*). American Long-eared Owl. A permanent resident; breeds. Mr. Francis Butterfass informed me that it was abundant about Cold Spring, where he often shot specimens. It breeds on Constitution Island, where I surprised a family of young ones, accompanied by their parents. It was at mid-day; the Owls sat in a group, with necks elongated, and ears erect. The sun shone bright, but, when disturbed, they flew without apparent inconvenience.

*Dimensions.* — Measurements of No. 2,021, ♂ ad. April 9, 1880, Constitution Island, Hudson River, N. Y., E. A. M.: length, 14·30; stretch, 36·00; wing, 11·00; tail, 6·00; culmen measured from frontal feathers, 1·06; bill from nostril, ·54; gape, 1·20; tarsus, 1·55; middle toe, 1·11; middle toe and claw, 1·65. Measurements of No. 2,062 ♀ ad. June 23, 1880, Constitution Island, E. A. M.: length, 14·90; stretch, 37·75; wing, 11·00; tail, 6·40; culmen measured from frontal feathers, 1·15; from cere, ·70; gape, 1·32; tarsus, 1·68; middle toe and claw, 1·85.

**129. Asio accipitrinus** (*Pallas*). Short-eared Owl. Occasional in spring and fall.

**130. Strix nebulosa** (*Forster*). Barred Owl. A permanent resident; breeds. Its notes may sometimes be heard during day-time.

*Dimensions.*—Measurements of No. 1,328, ♀ ad. October 23, 1876, Highland Falls, N. Y., E. A. M.: length, 19·25; stretch, 44·75; wing, 12·00; tail, 8·88.

**131. Nyctea scandiaca** (*Linnê*). Snowy Owl. Occasional in winter. One was captured in Orange County, about January 20, 1877. Has been reported from numerous points along the Hudson as far up as Fort Edward, in Washington County.

I saw this splendid Owl in the wild state on the 29th of October, 1880, near Garden City, on Long Island, N. Y. It flew from near the railroad: watching it from the car, I saw it alight on the ground amongst some sandy knolls, covered with red bunch-grass. On arriv-

ing at the nearest station, I started back, for the purpose of shooting it, but was disappointed in not finding it where it was seen from the train. It was found, however, about a mile farther east, surrounded by Crows (*Corvus americanus*), upon a sandy spot, where it looked like a patch of snow, in the midst of its black tormentors. The Crows scattered as I approached, and the Owl also flew slowly off, keeping just above the grass. It was followed by a part of the Crows, and soon lighted amongst the tussocks of grass. I crept up to within range, and shot it with No. 4 shot, and gave the hindermost of the retreating Crows the benefit of the left barrel, which was loaded with Bs. The Owl was not dead when I reached it, but made a fine display of courage when caught. Its eyes were wonderfully bright and full of fire; and it snapped its bill, and clawed fiercely; I offered it an empty shell, when reloading, which it seized and bit viciously. It uttered a squealing and also a grunting noise.

*Dimensions.*—Measurements of No. 815, ♂ ad. December 1, 1875 (shot on the south side of Long Island, N. Y., by Wm. Birch): length, 23·50; stretch, 58·31; wing, 14·75; tail, 9·38. Its stomach was distended with feathers. Measurements of No. 2,108, ♂ ad. October 29, 1880, Garden City, Long Island, E. A. M.: length, 22·85; stretch, 59·00; wing, 15·75; tail, 9·50; culmen, measured from frontal feathers, 1·53; from cere, 1·00; gape, 1·98; tarsus (about), 1·90; claw of the middle toe, 1·18. Stomach entirely empty.

## Family, FALCONIDÆ.

**132. Circus hudsonius** (*Linné*). Marsh Hawk. A permanent resident; breeds. It occurs regularly in winter; particularly numerous in that of 1874–75, when numbers were observed in the bluish plumage. It breeds upon the marshes which connect Constitution, Consook and Iona islands to the main-land. One nest on Consook Marsh, which had been recently deserted by the young, was placed in the middle of the marsh; the ground around it was packed hard, and was bare of grass.

**133. Accipiter fuscus** (*Gmelin*). Sharp-shinned Hawk. A permanent resident; breeds.

Next to the Broad-winged, this is our most abundant Hawk. It builds upon trees, for the most part, though some nests are placed on ledges of rocks. During the spring movement, this species sometimes migrates in large flocks.

*Dimensions.*—Average measurements of three males: length, 11·45; stretch, 21·00; wing, 6·60; tail, 5·37; gape, ·65; tarsus, 1·96; middle toe, 1·19. Measurements of female: length, 14·00; stretch, 25·75; wing, 7·70; tail, 6·65; tarsus, 2·11.

**134. Accipiter cooperi** (*Bonaparte*). Cooper's Hawk. A summer resident. Probably occurs in winter. Breeds abundantly.

I found a nest May 10, 1876, and fired a charge of dust shot into it to make it certain whether the nest was occupied, or not; the parent bird flew swiftly away, and, though I waited a long time for its return, it did not come back. Visiting the nest another time, I shouted and made as much din as possible about the tree; after a while the bird arose and looked over the edge of the nest, and then resumed its place upon it; a moment later it flew swiftly away. I fired after it, and the shot took effect in its breast and head; stretching its legs away down, and raising its wings high and beating them swiftly, it moved slowly in a wide circle, very high in the air; it came around above the nest, and then dropped just at my feet. Although not very severely injured, it made no display of courage. The nest, built in the quadruple fork of a chestnut-tree at a height of about forty feet, was composed of sticks, all of which were of small size; there was not a feather in it, and no pretence of a lining, save a few pieces of white-oak bark; its depression was slight. The eggs, four in number, were quite fresh: white, with a strong greenish tinge, with a few brown blotches on two of them.

A nest found May 2, 1878, was built in a basswood-tree (*Tilia americana*), beside a swampy pool in the midst of a wood. When approached, the female left her nest, and alighted on the opposite side of the morass; she was joined by her mate, and both set up a singular barking cry, repeated in rapid succession, and resembling, as much as anything, the prolonged utterance of the Flicker (*Colaptes auratus*). Then the male approached, and, circling overhead, lit on a tree near the nest, but soon retreated to the opposite side of the pool; both birds continuing their singular cry. The male bird was shot as he soared overhead, and his mate withdrew, and did not return that day. The nest was somewhat bulky, and contained four eggs. It was rather more concave than usual; built of small sticks, lined with a few pieces of rough bark, with no additional materials. The eggs differed from those previously described only in having no spots, which latter are unusual.

One nest contained only three eggs.

*Dimensions.* — Measurements of No. 1,226, ♀ ad., May 10, 1876, Highland Falls, N. Y., E. A. M.: length, 19·75; stretch, 35·00; wing, 10·13; tail, 8·75.

**135. Astur atricapillus** (*Wilson*). American Goshawk. A winter resident, and spring and fall migrant. Seen in spring as late as April 28 (1877).

The Goshawk is rather frequently met with; but, owing to its shyness, is rarely killed I obtained a single specimen from the Catskil.

mountains; and Mr. Wm. Church Osborn procured one at Garrisons, on the Hudson. Miss Anna B. Warner obtained a fine adult male on Constitution Island, on December 27, 1880. The gunners occasionally kill one. It likes to stay about the river marshes in winter.

*Dimensions.*—Measurements of No. 2,005, ♀ juv. December 2, 1879, Catskill mountains, N. Y., E. A. M.: length, 23·75; stretch, 44·25; wing, 13·10; tail, 11·00; culmen, ·90; gape, 1·40; tarsus, 2·88; middle toe, 1·81; its claw, ·77. Measurements of No. 2,170, ♂ ad., December 27, 1880, Constitution Island, Hudson River, N. Y., E. A. M.: length, 21·50; stretch, 41·50; wing, 12·50; tail, 9·50; tail, 9·50; culmen, measured from frontal feathers, 1·12; from cere, ·83; cere; ·40; gape, 1·25; tarsus, 2·88; middle toe and claw, 2·23; middle toe alone, 1·75; its claw, ·67; hallux, ·97; its claw, 1·08; inner toe, 1·00; its claw, 1·00; outer toe, 1·12; its claw, 53. Iris, bright carmine.

**136. Falco peregrinus nævius** (*Gmelin*). Duck Hawk; American Peregrine Falcon. A permanent resident; breeds.

I saw a fine mounted specimen in the possession of Mr. Daniel Ward, of Cornwall, which was shot while sitting upon a willow-tree in front of his residence, beside the Hudson. I have seen it frequently, but, chiefly through lack of skill in the use of the gun, have killed no specimens in the Highlands, though I procured one on the beach opposite Sayville, on Great South Bay, Long Island, on the 6th of October, 1880. There were several Duck Hawks on the beach, preying on small birds. The specimen shot had been feeding upon various passerine birds, which had first been roughly picked, and swallowed in large pieces. Whole legs of the Robin, Alice's Thrush, Catbird, and Warblers were found in its crop.

Upon the cliffs between West Point and Cornwall, the young are sometimes seen or heard; but the nest has not been found, and would probably prove to be inaccessible should it be discovered.

*Dimensions.*—Measurements of No. 2,100, ♀ juv. October 6, 1880, Sayville, Long Island, N. Y., E. A. M.: length, 19·40; stretch, 45·50; wing, 14·00; tail, 8·25; culmen from frontal feathers, 1·09; from cere, ·85; cere alone, ·30; bill from nostril, ·81; gape, 1·85; tarsus, 2·23; middle toe and claw, 2·78; toe alone, 2·15; claw, ·75.

**137. Æsalon columbarius** (*Linné*). Pigeon Hawk. By no means rare in autumn, winter and spring. My only specimen taken in the Highlands was shot in the act of destroying a hen.

*Dimensions.*—Measurements of No. 2,085, ♀ juv. September 16, 1880, Highland Falls, N. Y., E. A. M.: length. 12·60; stretch, 26·40; wing, 8·25; tail, 5·75; bill, measured from frontal feathers, ·72; from cere, ·59; from nostril, ·54; gape, ·85; tarsus, 1·57; middle toe, 1·45; middle toe and its claw, 1·80; claw alone, ·48.

**138. Tinnunculus sparverius** (*Linné*). Sparrow Hawk. A

rare resident species. Never abundant except occasionally during migrations.

On February 18, 1879, Dr. Clinton L. Bagg saw a Sparrow Hawk at the foot of 110th street, at the East River in New York City, where it seemed to be chasing the House Sparrows (*Passer domesticus*). It appeared to be in nowise frightened at the numerous workmen about the docks, and flew about amongst them, and out over the river, frequently perching on some iron pillars on shore.

*Dimensions.*—Measurements of No. 1,355, ♂ ad. April 25, 1877, Highland Falls, N. Y., E. A. M.: length, 10·42; stretch, 22·38; wing, 7·37; tail, 4·85; culmen, measured from cere, ·45; gape, .70; tarsus, 1·40; middle toe and claw, 1·21.

**139. Buteo borealis** (*Gmelin*). Red-tailed Hawk. A permanent resident; abundant; breeds.

This handsome Buzzard feeds on mice, moles and shrews, which it finds in meadows. Though it likes to sit on a hay-pole and swoop down upon such small fry, it is often quite formidable, carrying off fowls from the barn-yards. It is able to capture even the Ruffed Grouse (*Bonasa umbellus*). I once saw a Red-tail fly a quarter of a mile, bearing a full grown Ruffed Grouse in its claws. I followed, and fired a shot at it, which caused it to let its prey drop to the ground from the tree where it was feeding; it afterwards appeared to regret leaving the Grouse, which was quite neatly picked, and had one side of the breast partly eaten.

Mice, shrews and moles are especially abundant upon the salt marshes which join numerous so-called islands in the Hudson River to the main-land. Upon the edges of these marshes and on the hay-poles, our three Buzzard Hawks (*Buteo borealis, B. lineatus and B. pennsylvanicus*) are ever present during the hard times in winter, hungry and shy, and ever ready to pounce upon the first unlucky quadruped that makes its appearance on the scene. It is pleasant to see them swoop upwards from the ground and alight upon a haystack, closing their wings instantly as their strong claws grasp the top of the pole, and striking at once a perfect balance, without a wing-stroke or a sudden movement.

*Dimensions.*—Measurements of adult female: length, 21·90; stretch, 51·00; wing, 14·75; tail, 9·00; culmen, 1·07; cere, ·54; gape, 1 80; tarsus, 3·34; middle toe, 1·60; its claw, ·88.

**140. Buteo lineatus** (*Gmelin*). Red-shouldered Hawk. A permanent resident; abundant; breeds.

**141. Buteo pennsylvanicus** (*Wilson*). Broad-winged Hawk. Our most abundant Hawk. A permanent resident, but only occasional in winter; breeds.

Migrants begin coming early in March, and, ere long, large flocks

appear, flying swiftly overhead, or soaring circularly. On wing, it gives several screams uttered in rapid succession, followed by a squealing note. It feeds on small quadrupeds, and salamanders. None of the numerous specimens dissected contained feathers, or other evidence of its feeding on birds.

In the spring of 1871, a nest was built in the wood adjoining my house, from which I took one of the young birds; it became a very interesting pet, quite gentle, and fond of me, but refusing to submit to being handled by any one else; but it was prone to wander abroad, and so was lost.

On May 8, 1872, I shot a male Broad-winged Hawk upon its nest, wounding it badly. It clawed me severely when I attempted to capture it. The nest was simply a repaired Crow's nest, from which I had taken a suite of eggs the year previously. The eggs, as in every nest that I have seen, were two in number. I shot the female several days later, and found it to be in immature plumage, although mated with an old bird. During the same season, another pair built a nest in the same wood, but both birds were shot before the eggs were laid. This nest became the home of still another pair of Broad-wings on the following season. They laid only two eggs, which were remarkable for being almost unspotted. When I climbed to the nest, the male bird flew to a branch over it, uttering loud, squealing cries, and thence darted swiftly past me, in uncomfortably close proximity to my head, so that I could feel the rush of air when he passed; then, perching above me again, he would lower his head, partly spread his wings, and incline his body downwards, uttering a whining whistle as he prepared to make another swoop. He looked very formidable. I heartily wished myself at the bottom of the tree. Only when I had reached the nest did the female leave it; then she merely withdrew to an adjoining limb, and replaced herself upon the nest as soon as I began to descend. Then the anxiety of the male (greatly to my delight) appeared to be much lessened. I left the eggs, hoping that more would be deposited, but in this I was disappointed. Several days later, I took the eggs, and found embryos considerably developed.

This Hawk commonly selects a deserted Crow's nest to build upon; but I have known them, several times, to build a new nest. I have twice found immature birds breeding, in which the stripes covered the belly.

*Dimensions.*— Average measurements of two *adult males:* length, 15·85; stretch, 35·85; wing, 10·58; tail, 6·65; culmen, measured from cere, ·74; cere, ·48; tarsus, 2·50; middle toe, 1·33; middle toe and claw, 1·84; claw alone, ·65. Average of three *adult females:* length, 17·08; stretch, 37·65; wing, 11·75; tail, 7·03; culmen, measured from

cere, ·77; cere, ·50: tarsus, 2·75; middle toe and claw, 1·90; claw alone, ·64. Average of two *young males:* length, 15·93; stretch, 35·62; wing, 10·78; tail, 6·85; culmen measured from cere, ·68; cere, ·45; gape, 1·20; tarsus, 2·35; middle toe and claw, 1·70; toe alone, 1·18; claw, ·58 Average of two *young females:* length, 16·45; stretch, 36·69; wing, 11·08; tail, 7·15; culmen measured from frontal feathers, 1·12; from cere, ·77; bill from nostril, ·72; gape, 1·37; tarsus, 2·43; middle toe and claw, 1·83; middle toe, 1·33.

**142. Archibuteo lagopus sancti-johannis** (*Gmelin*). American Rough-legged Hawk. Occurs rarely during migrations. I have also found it at Fort Miller, on the Hudson, in November, 1876.

**143. Pandion haliaëtus carolinensis** (*Gmelin*). American Osprey; Fish Hawk. A common spring and fall migrant; occasional during summer. Its nest was found upon the cliffs north of West Point, many years ago. A few years since, Mr. Harold Herrick found a nest near Yonkers, on the Hudson, which contained eggs.

*Dimensions.*—Average measurements of four specimens: length, 23·10; stretch, 64·00; wing, 18·25; tail, 8·40.

**144. Aquila chrysaëtus canadensis** (*Linné*). American Golden Eagle. Occasionally observed during spring, autumn and winter. It was formerly known to nest upon the cliffs on the west side of the Hudson, north of West Point; and it is not impossible that it still does so. Two Golden Eagles have been shot in the Highlands during the past few years. I have seen it on several occasions, but never in summer. In March, 1876, two of these Eagles were found in a certain spot in Putnam County for several weeks, but I did not succeed in shooting them. In April, 1872, I saw one twice, whose tail was all white, save a narrow terminal bar of black.

**145. Haliaëtus leucocephalus** (*Linné*). White-headed Eagle. A permanent resident; breeds.

The White-headed or Bald Eagle constitutes a marked and romantic feature of the superb scenery of this part of the Hudson, lending another charm to a scene already grand and impressive, but rendered sublime and awe-inspiring by the presence of this noble bird, seen perched upon some blasted tree above the massive cliffs, or soaring in higher atmospheric regions, far above reach of the coming tempest, while its shrill scream falls faintly upon the ear, answering the loud, quavering cry of its nearer mate.

In winter, when the river is frozen, the Eagles are seen soaring above the mountains, searching for the scanty prey upon which they are obliged to subsist when fish, their favorite food, is unattainable; but later, when the ice is in motion in the Hudson, carried swiftly by the current, numbers of them may be seen sitting in pairs upon trees low down by the river's edge, watching for their finny prey, or else

floating upon the ice in the stream, in company with Crows and Gulls. In summer, their favorite perch is upon some withered tree on the mountain's side, from which, at intervals, they descend to the river, or some secluded lake, to seek their food. When the ice first breaks up in the Hudson, the Eagles are sometimes extremely abundant. At that season I have counted more than twenty-five that were in view at once.

*Dimensions.*—Average measurements of two *adult males:* length, 32·85; stretch, 84·10; wing, 22·00; tail, 11·90; bill from frontal feathers, 2·48; cere, ·74; gape, 2·77; tarsus, 3·50; middle toe, 2·72; its claw, 1·37; inner toe, 1·66; its claw, 1·62; outer toe, 1·86; its claw, 1·17; hallux, 1·53; its claw, 1·69. Weight, 10 lbs., 4 oz., avoir. Average measurements of two *adult females:* length, 35·50; stretch, 89·00; wing, 24·00; tail, 12·25. Weight, 12 lbs., avoir.

## Family, COLUMBIDÆ.

**146. Ectopistes migratoria** (*Linné*). Passenger Pigeon. A permanent resident. A few breed; and a few occur in winter.

*Dimensions.*—Average measurements of five *adult males:* length, 16·67; stretch, 24·30; wing, 7·88; tail, 7·80; culmen, ·72; gape, 1·12; tarsus, 1·14; middle toe, 1·16; its claw, ·37; middle toe and claw, 1·50. Average measurements of five *adult females:* length, 15·92; stretch, 23·96: wing, 7·76; tail, 7·27; culmen, ·70; gape, 1·06; tarsus, 1·07; middle toe, 1·09; its claw, ·35.

**147. Zenædura carolinensis** (*Linné*). Mourning Dove; Carolina Dove. A permanent resident; breeds. Only occasional in winter.

*Dimensions.*—Average measurements of five specimens: length, 11·85; stretch, 17·90; wing, 5·72; tail, 5·50; culmen, ·53; bill from nostril, ·36; gape, ·76; tarsus, ·86; middle toe, ·80; its claw, ·24; middle toe and claw, 1·00.

## Family, TETRAONIDÆ.

**148. Bonasa umbellus** (*Linné*). Ruffed Grouse; Pheasant; Partridge. An abundant resident species; breeds.

## Family, Perdicidæ.

**149. Ortyx virginiana** (*Linné*). American Quail; Bob-white. A permanent resident; breeds.

# BULLETIN

OF THE

# ESSEX INSTITUTE.

VOL. 12. SALEM, OCT., NOV., DEC., 1880. NOS. 10, 11, 12.

REGULAR MEETING, MONDAY, JULY 5, 1880.

ADJOURNED to Thursday, July 8. PRESIDENT in the chair. Records read. Correspondence and donations announced.

Rev. G. M. Harmon, of Peabody, was elected a resident member.

Adj.

REGULAR MEETING, MONDAY, JULY 19, 1880.

MEETING this day at 7.30 P. M. The PRESIDENT in the chair. Records read. Correspondence and donations announced.

B. O. Pierce, of Beverly, and Ira J. Potter, of Ipswich, were elected resident members.

Adj.

## Field Meeting at Bradford, Friday, July 30, 1880.

By the polite invitation of Dr. George Cogswell of Bradford, an associate member of the Institute, a meeting was held at the Riverside Farm, in that town, this day. The weather was remarkably fine, and the attendance large. The Farmers' and Mechanics' Institute of Haverhill and Bradford joined in the exercises of this interesting occasion. The members and their friends from Salem and vicinity left the Eastern railroad station at 8.15 A. M., in a special train for Danvers, thence by the Boston & Maine railroad to Bradford, arriving at 9.30 A. M. Barges and other vehicles were in readiness to take the party, some two or three miles above the village, to the grounds of Dr. Cogswell, which are situated very attractively upon a bend in the Merrimac river, and consists of several hundred acres. From the house is an extensive view of the river with its interesting traditions and lovely scenery. The city of Haverhill being built upon a gentle acclivity, the houses and other buildings being interspersed with trees, gives an additional charm to the prospect. A short drive beyond the house brought the party to a large grove, where the tables for the lunch were placed, and which was the headquarters for the forenoon.

As the dinner hour approached, the ramblers who had wandered hither and thither, about the woods and on the banks of the river in search of specimens, returned, and lively groups gathered around the tables.

### THE BRADFORD ACADEMY

is the venerable, highly esteemed, and cherished institution of this town, and has its origin and outgrowth in the deep interest among the parents in mental and

moral culture, and a desire that female education especially should be advanced; the privileges, that the children to-day enjoy, did not then exist. Incorporated in 1803, a building was erected, and the preceptor elected was *Rev. Samuel Walker*, a native of Haverhill, a graduate of Dart. Coll., 1802, and the minister of the South Church, Danvers, now Peabody, from 1805 to his death, July 6, 1826. *Rev. James Flint*, who was the pastor of the East Church, Salem, from 1820 to his death, March 4, 1855, was the third principal.

*Benjamin Greenleaf* was the fourth principal, from Dec. 12, 1814 to April 6, 1836. During this period, it obtained a wide and most honorable reputation. In 1828, the school was divided into a male and female department, Mr. Greenleaf had charge of the former, and Miss Abigail C. Hasseltine of the latter.

In 1836, Mr. Greenleaf retired. The male department was then closed, and the Institution was devoted entirely to the education of females. Mr. Greenleaf then took charge of the Bradford Teachers' Seminary, and continued at its head till its discontinuance in 1848, when his professional labors as a teacher closed. As an author, he was very widely, eminently, and honorably known; while the number of his pupils went up into the thousands, the number of copies of his text-books went up into the millions; he died Oct. 29, 1864.

*Miss Abigail Carleton Hasseltine*, born in Bradford, March 15, 1788, a graduate of the school, appointed assistant teacher in the summer of 1815, principal of the female department in 1828, retired in the autumn of 1852, died January 13, 1868,—the beloved teacher and friend, and whose name is cherished in thousands of homes to-day,—contributed largely to the success of the Institution.

This Academy has done much in sending out an educated influence in domestic and social life, in ways that cannot be tangibly measured. It was in this school that Ann Hasseltine and Harriet Atwood were educated. *The first* was the youngest sister of the principal above named; she was brilliant and gifted, and married Rev. Adoniram Judson, who was ordained at the Tabernacle Church in Salem in 1812, and sailed with his wife immediately afterwards to Calcutta. She was a remarkable woman, passed through many trials and exciting experiences, and wrote a history of the Burmah mission; she died at Burmah, Oct. 24, 1826. *The second* married Rev. Samuel Newell, who was ordained as a missionary at the same time with Rev. Mr. Judson, and went to Ceylon. She died 30 Nov., 1812.

Honorable mention might be made of other teachers and other graduates, who have done good service in the work which they have respectively undertaken.

The present building, in the midst of ample grounds beautifully laid out, is in striking contrast with the humble wooden edifice, first erected for this now flourishing institution. It measures 216 feet front line, 127 feet from front to rear; four stories above the basement; built of brick with underpinnings and facings of granite. The entire building is heated by steam, lighted by gas, and has all the modern appointments. On Thursday, June 16, 1870, a very pleasant meeting was held in Bradford, the afternoon session being in the hall of this building, then recently erected and opened for the reception of pupils.

### HANNAH DUSTON MONUMENT IN HAVERHILL.

During the day, several of the party visited the Haverhill Public Library, and the monument erected in

Haverhill to the memory of Hannah Duston, who in 1697 was seized and carried away by the Indians, and who then performed the wonderful exploit of putting her captors to death, for which act the General Court made substantial acknowledgment of her bravery.

This beautiful monument was erected upon the spot set apart as a public park, by the people in the early history of the town, and was unveiled with suitable ceremonies on Tuesday, Nov. 25, 1879, and presented to the city by Hon. E. J. M. Hale.

The pedestal is of granite and the statue is of bronze, 6 feet high, and the entire height is 15 feet. The bronze reliefs are each 2 feet 3 inches by 1 foot 6 inches, and represent: *First*, her capture; *second*, escape of her children; *third*, slaying of her captors and her escape; and *fourth*, her return. The ideal statue was designed by Mr. C. Weeks of Haverhill, and the casting was made at Chicopee, Mass.; the base was cut by Mr. Weeks, who put the whole structure in position.

Haverhill for seventy years was a frontier town, and its early history tells of many cases of savage cruelty perpetrated by the Indians upon its first settlers. The name of Hannah Duston will ever stand prominent in the annals of the town.

### HAVERHILL PUBLIC LIBRARY.

Hon. E. J. M. Hale (the gentleman who gave to the city the Hannah Duston monument, previously mentioned), desirous of having a Public Library in his native city, submitted January 29, 1873, a proposition to the city government of Haverhill.

That His Honor, the Mayor, appoint six persons as Trustees for life, and the vacancies to be filled by the remaining Trustees, to receive all funds and administer

the same for the purposes of the proposed library. That within six months to give a certain specified lot of land to the Trustees, and $30,000 on condition that a further sum of $30,000 be raised and paid to the said Trustees for the uses and purposes aforesaid, and that the city government in accepting these funds shall assume and bear the current expenses of library, grounds, and appurtenances, after the building shall have been completed and furnished. The city chose six Trustees, Aug. 1, 1873, and accepted the proposals Nov. 17, 1873. The building was accepted and occupied in May, 1875, dedicated Nov. 11, 1875, and opened for public use the following week.

The building is 72 feet front on Summer street and extends back 55 feet. Height of different stories as follows: Basement, 12 feet; *first* story, 16 feet; *second*, 20 feet. Cost of building and furnishing $49,543.32; books purchased $16,528; making the total cost, including binding, moving, etc., $67,711.78; to this is to be added the valuation of the land $12,000, making the value of the whole property $79,711.78.

The whole number of volumes in the library January 1, 1880, was 29,235; additions, during the year 1879, 2,411. *Trustees*, E. J. M. Hale, James H. Carlton, James E. Gale, R. Stuart Chase, John L. Hobson, John Crowell. *Librarian*, Edward Capen.

AFTERNOON SESSION.

The afternoon session was held on the floor of the large barn extemporized for the occasion into a lecture room; as the large doors swung open, row after row of settees appeared in the foreground, and beyond, in the rear of the speaker's table, framed in the open doorway a beautiful piece of landscape. The fragrant hay mow was

speedily transformed into a balcony where young and old gathered to listen. The meeting was called to order at 2.30 P. M. The President in the chair, records of the preceding meeting were read by the Secretary. The PRESIDENT congratulated the Institute, that, under such favorable auspices, another field day is held in this good old town and with so large an attendance. He then briefly alluded to the previous meetings held in this and the adjoining town of Groveland, which was known as the East Parish of Bradford, when the first meeting was held in that place. He spoke of the early explorations of the Merrimac river, particularly the one under the direction of Simon Willard and Edward Johnson, commissioners, in 1652, John Sherman and Jonathan Ince the surveyors, to ascertain the northern boundary of the colony of the Massachusetts Bay, as stated in the charter, three miles north of the northernmost point of the Merrimac river. This was a mooted question for many years, and it was not finally adjusted until the appointment of a commissioner in 1737, who determined that the northern boundary of the Massachusetts line should be a line three miles from the mouth of the river at Newburyport, thence parallel with the river as far as the Pawtucket Falls, thence west to the New York line. In 1740, His Majesty, by the concurrence of the council, adjudged and ordered this line as the northern boundary. He then called upon Dr. George Cogswell, the host, who had generously and handsomely provided so many good and pleasant things for this meeting.

DR. COGSWELL spoke of the pleasure he experienced in welcoming the members of the two societies to his farm, and said that he was thoroughly in accord with the objects and aims of such meetings as this. He also

referred to the former men of Essex county whose influence was still felt in this community, and to the pride he felt in the scientific and educational interests of the county. He closed by introducing

Rev. Mr. Kingsbury of Bradford, who continued in the same general strain, eulogizing the work and objects of the Institute and welcoming the society to Bradford.

Prof. E. S. Morse, of Salem, followed, selecting as his theme, the *Pelopœus* (the mud wasp), now building its earthen cells and plastering them on old rafters and stone walls. He described its habits, exhibited specimens of its cells and illustrated the same with blackboard drawings; he also alluded to the barn swallows (*Hirundo horreorum*), having built their nests on the beams of the barn, and many specimens were noticed flying around. Later in the meeting, he gave some of his impressions of the Japanese as a people.

Other remarks were made by Mr. J. D. Tewksbury of Bradford, Prof. Hall of the University of Minnesota, Mr. Fish of the Salem Summer School, Mr. John W. Perkins of the Salem High School, and Mr. Emery of Lawrence.

Mr. John Robinson, of Salem, offered a vote of thanks to Dr. Cogswell and his family for the numerous courtesies and hospitality extended to the members and their friends. The meeting adjourned.

Barges and private carriages conveyed the party to the station, and thus ended a day of instruction and pleasure; and the participants will long remember the very delightful day at Riverside Farm.

## Field Meeting at Lowell Island, Thursday, August 12, 1880.

The third field meeting of the season was held this day at Lowell Island, near the entrance to Marblehead harbor. The steamboat, "White Fawn," left Phillips wharf at 9 and at 11 A. M., to convey the members and their friends to the island.

As usual, the party separated upon arrival, each to choose his own method of enjoyment. Some made for the bold, rocky points; some tried "luck" at fishing; and those interested in the pursuit of natural history found in the rocks, or on the beaches, or with a dredge and line from a boat, many specimens to occupy their attention.

Catta, afterwards Catt or Cat, and now Lowell Island, lies about four miles in a southeasterly direction from the City Hall in Salem, to which municipality it belongs, although somewhat nearer in position to Marblehead. From Gerry Island, at the mouth of Marblehead harbor, it lies due east and is about one mile distant. It is thought to have been heavily wooded before the settlement. "As we passed along," says Higginson, of the harbor, June 29, 1629, "it was wonderful to behould so many islands replenished with thicke woods and high trees." In 1738–9, "woods" are mentioned on it, and the tradition is, that it was finally denuded at the Revolution to afford British cruisers a more unbroken view into the harbor. During the operation of the Boston Port Bill and the British occupation of Boston, coasters were searched at Marblehead, and sent on with an officer on board, to Boston. Feb. 9, 1775, His Majesty's ship Lively, 20 guns, arrived at Marblehead harbor and anchored off the fort. May 31, she sailed for Boston, and her place was taken by the sloop-of-war

Merlin. January 7, 1776, a contemporary private journal says, "Trees on Cat Island cut down last night—supposed by the Merlin."

Its shores are for the most part steep and rocky; its average elevation of surface being perhaps twenty or twenty-five feet. It is at present without a tree or shrub, and commands an uninterrupted view towards the ocean, which is unsurpassed, as well as on the land side, the green slopes of the North Shore, Salem Neck, and Naugus Head.

The first mention we find of the island is contained in the Colonial Records for 1655.[1] It was then granted to Governor Endicott on his own request, May 23, and is there described as "*the iland called Catta Iland, being about a two acres, lying neere to Marble Head.*" In point of fact, it has an area of about sixteen acres of upland. Felt, following Dr. Bentley, who seems to have been in error, states the area at "about nine acres." Dr. Bentley wrote in his Description of Salem in 1800, "the extent of the soil is 2,167 links, about N. W. and S. E.; but the rocks being included, the island is above 28 chains. At the northwest end is a high beach which forms a point directly opposite Marblehead. The shore is irregular and rocky. There are springs on the S. E. end which terminates in a high, rocky head."

Gov. John Endicott,[2] in a will which took effect upon his death in 1665, left the island to his wife for life, and after, to his "two sons John and Zerobabel, or the longest liver of them." John died first without issue, and Zerobabel on his decease, 1684, gave the island to his five daughters.

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[1] See Colonial Records of Massachusetts, Vol. III, p. 389. [2] Gov. John Endicott died March 25, 1665. See "The Endicott Family," by C. M. Endicott, N. E. Hist. Gen. Reg., Vol. I, p. 335.

From the Endicott family it passed through Samuel, a grandson of Zerobabel, by deed March 4, 1687–8,[3] to Richard Reed of Marblehead, and in this family, always conspicuous in the affairs of that town, the title remained for many years. On March 25, 1732, it came into the hands of Samuel Reed,[4] by virtue of an indenture of partition executed by the children of the late Samuel Reed, his father, and by Ebenezer Lowell, who married a daughter, and from him, after being mortgaged Feb. 20, 1738–9,[5] to "the Honorable James Bowdoin of Boston, Esquire" (afterwards the successor of John Hancock as governor of the Commonwealth), as "Catt Island together with the House and Woods thereon," the property passed in equal parts, Feb. 12, 1746–7,[6] to "Joseph Willson, Gentleman, and John Oliver, Victualler," both of Malden, in the county of Middlesex. In this and subsequent conveyances, mention is made of the house but not of the woods, and since several of these conveyances are made to inn-holders of Malden, Charlestown and Marblehead, it is a fair presumption that the very considerable value attaching at this time to Catt Island was due to its being occupied as a place of public entertainment. September 2, 1773, the property passed in equal shares to Elbridge Gerry (afterwards Governor and Vice President), Col. Azor Orne, Captain (afterwards Gen'l) John Glover, and Jonathan Glover, Esq.,[7] all of

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[3] Essex Reg. Deeds, vol. XII, fol. 166. [4] Essex Reg. Deeds, vol. CXV, fol. 103, also vol. LXI, fol. 156–8. [5] Essex Reg. Deeds, vol. LXXVIII, fol. 121. [6] Essex Reg. Deeds, vol. XCIII, fol. 16, and vol. XCVIII, fol. 30.

[7] Honored names in Marblehead. Hon. Col. Azor Orne, son of Joshua and Sarah (Gale) Orne, b. in Marblehead, July 22, 1731, d. at Boston, June 6, 1796. He was a descendant from Deacon John Orne of the 1st church in Salem, who died at an advanced age in 1684.

*Elbridge Gerry*, son of Thomas Gerry, born in Marblehead, July 14, 1744, died in Washington, Nov. 13, 1814, in the office of Vice President of U. S. A.

Marblehead, projectors of the Essex Hospital for inoculation with the small-pox. After the failure of this enterprise, the island passed by various conveyances between 1795 and 1816, to members of the Fettyplace family of Marblehead, and from them, through William Fettyplace of Salem and East Boston, who became the owner o the whole estate, to John Roundy of Marblehead,[8] Nov. 2, 1846, who sold, Feb. 11, 1848, to Nathaniel R. Blaney of Marblehead,[9] the island "with all the buildings thereon," and he in turn to David Blaney of Marblehead,[10] January 30, 1849, who conveyed the property, June 11, 1851, to Stephen C. Phillips of Salem.[11] January 16, 1852, the title passed to the Salem Steamboat Company,[12] a corporation created by act of May 23, 1851, and authorized "to purchase, build, charter, or otherwise hold and employ, a steamboat to be employed in and about the harbor of Salem." The Essex Railroad was incorporated March 7, 1846, and opened to Phillips' (formerly Crowninshield's) wharf, July 2, 1849. A commodious hotel was erected on the island, now first called Lowell Island, which was opened to the public, June 21, 1852, and the passenger steamer "Argo," plied between the island and Phillips' wharf. July 10, 1857, the Steamboat Company sold to Gorham A. Pollard of Lowell,[13] who made an effort to have the island known as Pollard's Island; and, from him, through several conveyances, the property passed to the present proprietor, Samuel B. Rindge[14] of Cambridge.

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The Brothers Jonathan & John Glover, sons of Jonathan & Tabitha (Bacon) Glover, of Salem, removed in early life to Marblehead, & for many years held various offices of honor & trust. Jonathan was born June 13, 1731, John, Nov. 5. 1732; a Brigadier General in the army of the Revolution; died at Marblehead, 30 Jan'y, 1797. Essex Reg. Deeds, vol. CXXXII, fol. 178. [8] Essex Reg. Deeds, vol. CCCLXXIII, fol. 291. [9] Essex Reg. Deeds, vol. CCCXCIII, fol. 214. [10] Essex Reg. Deeds, vol. CCCCXII, fol. 245. [11] Essex Reg. Deeds, vol. CCCCXLVI, fol. 155. [12] Essex Reg. Deeds, vol. CCCCLV, fol. 206. [13] Essex Reg. Deeds, vol. DLV, fol. 146. [14] Essex Reg. Deeds, vol. DCCCCXCI, fol. 131.

It would be very satisfactory, if the uncertainty hanging about the name of this island, in common with others near it, could be removed. When it was first called Cat Island none of the authorities tell us; but they assume to tell us why it was called Cat Island. The accepted explanation seems to be that "Cat" is a corruption or contraction, and that the island was in some way connected with Robert Cotta, from whom it derived its singular appellation. There is no evidence that Cotta ever owned or occupied the island, nor does he seem to have been a person of special repute or standing, such as to make it probable that the island would have belonged to him or been named for him. He was made a "freeman" May 6, 1635, and the Colonial Records spell his name "Cotty." This is the first we know of him. Ralph Fogg's Waste Book of the Quarter Courts, 1636–7, spells his name "Cotta." The terminal "a" in those days was doubtless sounded like the "a" in "fate." In John Holgrave's record of a Town Meeting, 14th, 6th mo., 1637, his name is spelled "Cottie." In Roger Conant's list of apportionments of marsh and meadow lands, made at a general Town Meeting in 1640, his name appears as "Cotty." And so Gov. Endicott spells it, 11th, 8th mo., 1640, but in his record of a meeting of the "seven men," 12th mo., 1644, Gov. Endicott calls him "Cotta." In 1645, Robert "Cotta" gets £5 allowed him for a cow out of funds provided by Mr. Andrews of London for that purpose. And the records from 1647 to 1651 show his name, in several instances, spelled "Cotta."

The first mention of the island, so far as we know, occurs in the Massachusetts Colonial Records for 1655. It was then granted to Gov. Endicott, and had never been previously granted to any other person. Gov. Endicott died in 1665, leaving it by will, after the

decease of his wife, to his two sons, or the longest liver of them; and his son Zerobabel, the survivor, died in 1684, leaving it to his own five daughters. From the middle of the seventeenth century to its close, this island remained in the Endicott family.

If we knew so much and no more, we might readily find a theory to account for the name, without having recourse to Robert Cotta. If we were obliged to derive the name "Cat" from the sound represented by "Cottie," or "Cotty," it would be more reasonable to seek its origin in some possible diminutive or term of endearment which might have been in use in the family named Endicott, who owned the estate for many years, rather than to seek it in the name of Robert Cotta, who was not, so far as we know, in any manner nor at any time connected with Cat Island.

But why indeed, if we knew nothing more, derive the name of the island, any more than the name of Cat Cove, from any other source than the word "Cat?" Cat Island was granted to John Endicott while he was governor, on his own request. It must, therefore, have had a value. For what purpose? Hardly for agriculture; possibly for its timber; more probably as a fishing station, or a station for transport and freighting vessels on their way to Boston. In this case, we might well have supposed that it took its name, and perhaps Cat Cove as well, from the craft called Cat, or Cat Boat, a vessel of Norwegian origin, so numerous at one time in the Bay of Plymouth, England, as to have given to part of that harbor the name of Catwater.

Unfortunately, however, for all these hypotheses, a close examination of the actual spelling of the early records shows that they are all groundless, and remands the conscientious antiquary to his original uncertainty.

The grant from the Colony to John Endicott, in 1655, is to be seen at the State House. It describes the estate as Catta Island. The will of John Endicott, dated on the "2nd day of the 3d mo. called May" 1659, may be seen at the Suffolk Registry of Probate; so may an inventory of his estate made after his death in 1665; both these describe the property as Catta Island. At the Essex Registry of Probate, a contemporary copy of the will of John Endicott, made May 23, 1666, as well as the original of the will of Zerobabel Endicott, the survivor of his two sons, dated Nov. 23, 1683, and an official copy of the same made in September, 1684, are on file. All these describe the island by the name of Catta. Cat Cove had been called "Catt Cove" since 1638, when Roger Conant had a house there. And Robert Cotta, Cotty, or Cottie, is never known to have indulged in that delightful orthographic license which our ancestors enjoyed, but which we have surrendered, to the extent of writing his name with the letters Catta.

In a deed from an heir of the governor to Richard Reed of Marblehead, dated Boston, March 10, 1687–8, the island is conveyed and is described as being "commonly called and known by ye name of Catt Island." A second inventory of Zerobabel's estate, dated March 4, 1696–7, also describes it as "Catt Island att the mouth of Marblehead Harbor." Thus it seems clear that, whatever was the origin of this singular designation, it attached itself to the island before 1687; that it was an abbreviation of Catta, and not in any way associated with Robert Cotta, nor with the daughters of Zerobabel Endicott; whether with the Cat Boat, which may have come down to us from the Norsemen,—whether with *Felis domestica*, the "harmless, necessary cat," we cannot determine.

Catta is a Latin synonyme for *felis*, and Gov. Endicott, who was enough of a linguist to speak French, was not averse to interjecting a foreign phrase now and then in his manuscript records, a practice quite in accord with the fashion of his times. Moreover, the word Catta has been used, the lexicographers tell us, as the name of a sea-craft, at least since A. D., 1071, and probably much longer. How much the ἄκατος of Herodotus and Pindar, —the ἀκάτιον of Xenophon and Thucydides, in which Plutarch says Cæsar made his escape from Alexandria and the wiles of Cleopatra—had to do with the origin of this word for "boat," we must leave to conjecture.

A century later, this spot inspired an interest somewhat graver than questions of philology excite. 1773–4 was a year of tumult. It was the year of the Boston Tea Party and the Boston Port Bill. The people of this province had lost confidence in the good faith of the only government they had, and were not yet able to see their way to the establishment of another. Lawless violence stalked abroad, and society seemed, for the time, to be thrown back upon its elemental forces. Week by week the feeling about the importation of tea grew intenser and more threatening. The daily journals teemed with protest and denunciation. Hutchinson's secret letters had been sent home by Franklin and read in the assembly. Accounts of burnings in effigy, and coats of tar and feathers, were as frequent as are runaways and coasting accidents to-day. In the midst of all this, as if to make confusion worse confounded, the scourge of small-pox, absent for many years, reappeared in Massachusetts Bay. The terror which the loathsome disease inspired, and the relief experienced from the new mode of treatment by inoculation, are well indicated in the narrative of an incident in the history of Cat Island, which we transcribe

from the contemporary journals of the period. Now that vaccination has so nearly eliminated this from our list of terrors, it is not easy to reproduce the scene of panic it created. Men shunned one another; tradesmen could with difficulty be persuaded to bring the necessaries of life to market, and sacred family ties seemed unable at times to bear a strain too great for human nature. Daily bulletins from Boards of Selectmen announced the lowest number of cases which could from day to day be charged against their respective precincts; and to allay those hideous suspicions which panic engenders in feverish times, rewards were offered for evidence to convict unknown persons of maliciously spreading the contagion about the streets.

The year 1773–4 was probably the most crowded single year in our local history. That year witnessed the last session of the Provincial Assembly; the first session of the Provincial Congress; one following close upon the other in the Town House at Salem;[15] and in the midst of this momentous session the first great fire in Salem occurred, consuming the Tabernacle Meeting House,[16] the Custom House, fourteen shops and eight dwellings, besides injuring and greatly imperiling the Town House itself. It was the same year in which Thomas Hutchinson quit the executive chair of the province for England, and Thomas Gage, the first military governor, succeeded him and established military headquarters, with two companies of the 64th regiment of the line, at the Collins Farm, in Danvers, whitening the Neck soon after with the tents of the 69th regiment from Halifax. Timothy Pickering was twenty-nine years of age, that

[15] Which stood on the corner of Essex and Washington streets, near the southern parapet of the tunnel.

[16] Which stood on Essex street, opposite Barton Square.

year, and Elbridge Gerry, thirty. In that year Marblehead was second in importance only to Boston among the leading towns of Massachusetts,— probably of New England,— while Salem, fourth on the list by the census of 1765, the earliest census of which we have authentic data, was behind her neighbor in gross population, as well as in the number of houses and of families, in taxable property and perhaps in tonnage.[17] A drive to Marblehead was then an indispensable requisite of Salem's hospitality to strangers.

In that year, systematic general inoculation first came into favor here. Inoculation had been in use in America since 1720, and in common use since 1760.

The nature of the disease, from which inoculation was proposed as an escape, is not such as to invite discussion. Vaccination, introduced at the end of the last century,[18] enables us to escape the sickening contemplation of it as a matter of general concern; but our ancestors were not

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[17] Nov. 27, 1714, the Churchmen of St. Michael's, at Marblehead, petitioned the Bishop of London for an English Clergyman, and described their town as "next Boston, the greatest place of Trade and Commerce within this Province." By the census of 1765, Salem and Marblehead compared as follows:—

| | Population. | Houses. | Families. |
|---|---|---|---|
| Salem | 4427 | 509 | 923 |
| Marblehead | 4954 | 519 | 935 |

Dartmouth, now New Bedford, was also then ahead of Salem. In the sermon on the ordination of Rev'd Ebenezer Hubbard over the First Church at Marblehead preached by Rev'd Elias Stone, Jan'y 1. 1783, the town is described as "before the American Revolution, swarming with inhabitants, a pattern of industry, flourishing in trade, abounding with wealth. From its numbers and opulence, as from a fountain, streams of wealth flowed out, which greatly enriched the vicinity and penetrated far into the country. About 1770, Marblehead was supposed next to Boston in population, bearing a proportion in the Province Tax next to Boston, and thought at that time to have imported more hard money than any other town in the province."

[18] Dr. Jenner vaccinated his first patient May 14, 1796, and on July 1st following and several subsequent dates, inoculated him without effect, thus demonstrating the success of his system. The same year, the system was introduced into America by Dr. James Jackson and Dr. Waterhouse. Dr. Thomas Pickman performed the first vaccination in Salem, Oct. 5, 1800.

so fortunate. It was to them one of those horrors too ghastly to confront. Deadly to a degree almost incomprehensible to us, its lethal force was perhaps its least offensive characteristic; for when not fatal, it left behind it blindness, debility, and the seeds of disorders only less desolating than itself. Just before the settlement of Cape Ann, it had completely depopulated this region of its native stock, and if we charge that familiar fact to the exposures and irregularities of savage life, what shall we say to the correlative fact, that of the patients under the best known scientific treatment in London Hospitals, thirty per cent. of those stricken with it died? In spite of inoculation, which Lady Mary Wortley Montagu had introduced from Constantinople in 1718–20, but which made slow progress, one-tenth of all the deaths in England, during the last half of the last century, were deaths from small-pox.[19] The statistics for New England cannot be very different. Private diaries of persons in the most favored positions in life are full of the records of friends sacrificed to this pest. Judge Lynde of Salem, though chief justice of the province, more than once removed his family from his house, and once sent them into the country and from place to place, to avoid danger during a period of contagion; and was once the recipient of an anonymous letter charged with the deadly infection, from the effect of which he happily escaped; and this too in the Revolutionary period, when a celebrated German surgeon, attached to the Hessian troops, Dr. Johann David Schöpff, writes home that in America inoculation is an "almost universal practice."

[19] The disease was no respecter of persons, but like death in all its forms, *æquo pulsat pede pauperum tabernas Regumque turres.* May 10, 1774, surrounded by all the splendors of Versailles, Louis XV, at the age of sixty-four, King of France since his fifth year, died a miserable death from a second attack of small-pox, a disease which he had had in youth and which he gave to the two princesses, his daughters, who attended his death bed.

In the light of modern science, inoculation seems to be an inadequate, if not a dangerous resort, and is now prohibited by law. It did not do away with the danger of infection as vaccination does, nor in any way decrease it. To some minds, the bringing together, at one point in a hospital, of so great a number of persons suffering from such a disorder, seemed likely to form a centre of propagation which might imperil the neighborhood. Moreover, the advocates of inoculation did not unite their forces in a vigorous struggle with its opponents, but were very much divided among themselves in our neighborhood, at the time in question, between two systems of practice, differing mainly in the application of mercurials. Before inoculation, pest-houses had been provided in out-of-the-way places, where the disease could be isolated and treated by nurses who had passed successfully through it. Beyond this, and the killing of all stray dogs and roping off of streets and sometimes of whole towns which were infected, little could be done.[20]

Lady Montagu, during her stay at Constantinople, found inoculation in common use there, and much prized by women as a protector of their beauty. She herself had lost her eyebrows from the ravages of small-pox, and counted her brother among its victims. With characteristic sagacity and nerve she applied the new treatment to her own children, and finally succeeded on her return to England, in recommending it to general attention. It was first practised in America, at Boston, in 1720, and though Increase Mather, with other leaders of the clergy,

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[20] Vessels were constantly bringing the disease from Barbadoes and in these cases their crews and cargoes, especially of cotton-wool, were often landed on Misery or Baker's Island. Harvard College was more than once dismissed on account of its prevalence, and many times the General Court was adjourned from place to place to escape it. Highways from town to town were securely fenced and guarded, and ferry boats discontinued.

brought all their priestly influence to bear in its favor, its adherents made slow progress. Nov. 20, 1721, there was but one physician, Dr. Zabdiel Boylston,[21] known to countenance and encourage the practice in Boston, though Mather argued the lawfulness of it on scriptural grounds, gravely urging: "Furthermore, I have made some enquiry, whether there be many persons of a prophane life and conversation that do approve and defend inoculation, and I have been answered that they know but of very few such. This is to me a weighty consideration. But on the other hand, though there are some worthy persons that are not clear about it, nevertheless it cannot be denied, but that the known children of the wicked one are generally fierce enemies to inoculation."[22]

It was claimed in behalf of inoculation, that it relieved those who submitted to it, for the rest of their lives, of the habitual and universal dread of taking the disease in the natural way. The unspeakable value of such exemption is obvious. Moreover, it was also demonstrated, that the disease thus artificially produced in a system previously skilfully prepared to receive it and developed under scientific conditions, in every way the most favorable, was not more dangerous nor afflictive than many others. Instead of amounting to one in three, four, or five of those affected, the number who died under the new treatment was found not to exceed one in seven hundred or a thousand, and was often stated much more favorably, and thoughtful people congratulated themselves that at last "that disease, which, taken by chance, hath proved the Bain of Tens of Thousands, now comes cloathed in gentleness,—all its Terribleness cast aside."

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[21] Dr. Boylston's life was threatened and adverse legislation attempted.

[22] Collections Mass. Hist. Soc., 1st ser., Vol. IX, pp. 275–80.

Washington was inoculated at New York, June 27, 1776. In that year, small-pox raged in Boston which was occupied by the British. A general inoculation was ordered there, July 3. These general inoculations required very extensive hospital accommodations. Cat Island had been early recognized as a desirable site for an establishment of this nature, and leading citizens of Marblehead, Salem, Beverly, and Lynn, had asked the needful permission of the Provincial Assembly.

The island had a sufficient area, with pure air, fine views, and a natural spring of water. It was of easy access, yet at a safe distance, and was at that time not wholly cleared of its growth of timber. It was purchased in equal shares, by four of the most prominent citizens of Marblehead: Col. Azor Orne, Elbridge Gerry, Esq., Capt. John Glover, and Jonathan Glover, Esq., and their enterprise and means secured, on a generous scale, the erection during the summer of 1773 of the needful buildings, at the high, rocky headland, near the spring of water. Even before their completion, popular distrust had begun to show itself and had so far prevailed over good sense, that on Sept. 19, a town meeting had been called at the instance of indignant opponents of the scheme, and the license granted by the town had been revoked. The projectors of Essex Hospital, however, were not the men to be daunted by popular clamor. Among them were the town's representatives in the general assembly and on the committees of correspondence. In a larger sense, they were representatives of the industry, wealth, and intelligence of the town. They had in hand a private enterprise of great public importance, and in order to demonstrate to their townsmen that a desire for personal profit was not among their motives, they made a public offer to the town of the whole property at cost.

This being declined, they pushed on the work with characteristic energy, and October 19, opened the Essex Hospital to the public with the sanction of the Provincial Assembly and under a rigid system of rules duly approved by the "gentlemen selectmen of Salem and Marblehead."

One of the selectmen of Salem was Timothy Pickering, jr., at that time captain of the 4th Salem Company in the 1st Essex Regiment of Infantry, of which he soon after became colonel. He threw himself with the same boldness and enthusiasm into the controversies growing out of the small-pox excitement of that year, as he did into every other on which he entered. A prolific and telling writer on military, patriotic, theological and political topics, he was at the same time engaged in a furious newspaper warfare with Rev. Dr. Whitaker in the Essex Gazette, as to which was the better of the two prevailing methods of inoculation, and had that summer made a saddle-journey alone to Albany, in the Province of New York, to secure the services of a celebrated surgeon attached to the Eighth (King's) Regiment of Foot, who practised the much-vaunted Suttonian method. This step he took as overseer of a hospital for inoculation, then building near Castle Hill in Salem, in "the great pasture common," which seems to have been the second institution of the kind opened in this province, the Essex Hospital alone being completed before it. Of Mr. Gerry, it is proper to say that he had in early life given much attention to medicine, a profession to which he was inclined and for which his father destined him; but the troubles of his country summoned him to more conspicuous service.

It will be seen that the sanction of the selectmen of Marblehead for the opening of the Essex Hospital was granted after an expression of public disapproval and dis-

trust by the citizens of the town, and this fact probably explains the occurrences which are to be narrated.

Besides generous kitchens and quarters for a steward, physicians, nurses and attendants, the hospital buildings contained an assembly room and ten large lodgings, each well-furnished for eight or ten patients. Eight persons might, before entering, club together and secure a room to themselves; otherwise, patrons were admitted and assigned rooms in the order in which their applications were recorded. Major Richard Reed kept, at his place of business in Marblehead, the class books, so called, in which the names of applicants were entered, and Jonathan Glover signed for the proprietors. An island guard and a crew of picked boatmen were enlisted and these were placed under oath. The regulations, which were published, provided that the guard "shall suffer no person to land on the island and no person to embark therefrom" without written passport. No letters can leave the island on any account. The average admittance fee seems to have been twelve dollars, payable in advance,—the average term of sojourn, four weeks, and a bond was given on entering, to insure the strict observance of regulations. A "coasting sloop" was provided for transportation, and these, with the addition of the usual outbuildings for the storage of uninfected clothing, for fumigation and the like, the whole intrenched behind a picket-fence with gates and sentry-boxes, completed the elaborate arrangements at this Castle of Uncleanness.

At the top of the main building, three stories in height, was constructed a system of signals by which the exact state of affairs on the island could be telegraphed ashore; and hundreds of anxious observers, all along the bay, may well be supposed to have levelled their glasses at sunrise for the daily bulletin, with a foreboding scrutiny

not unlike that with which the poet Key, at a later period, spied out the starry flag on Fort McHenry.

The establishment thus equipped, the first of the kind in the country, was placed in charge of two eminent specialists in their department of physic, Dr. Hall Jackson of Portsmouth, N. H., who had practised in London, and an assistant, Dr. Ananias Randall, from Long Island. The American, and not the Suttonian method, was practised, and to this Col. Pickering soon became a convert. Besides the professional supervision thus secured, the enterprise enjoyed the countenance and endorsement of eminent local practitioners, who made haste to enter themselves as patients. Dr. Ebenezer Putnam, sen'r, of Salem, "set off for Cat Island" for inoculation, October 25, and on Nov. 12, he with Dr. Elisha Whitney of Beverly, and Drs. Nathaniel Bond and Elijah Dix, united in publishing a card as patients of the Essex Hospital. Dec'r 3, Dr. Humphrey Devereaux, a leading physician of Marblehead, died there, at the age of 43, "universally regretted." Col. Peter Frye, Mr. Eaton, and other leading citizens of Salem, were there as patients.

The first class entered Essex Hospital, Oct. 19, 1773. It consisted of 103 persons of both sexes, filling the institution to its utmost capacity, went down "in high spirits," and, as the buildings and outfit were all fresh and uninfected, was not unnaturally attended to the island by a very large concourse of the best quality of the neighborhood. After leave-taking in the assembly room, the island was cleared of the throng and inoculation proceeded. The high spirits with which the party entered upon this strange experience suffered no abatement. Death did not invade their ranks, and so mild a type of the disorder was induced, notwithstanding the autumnal weather which was accounted as a little unfriendly for the first

venture, that we find them "daily displaying their signal of Health from the middle of the Island:"—"all in high spirits" Oct. 25,—"indeed confined to a strict regimen, but they may every day be seen walking the Island, shooting wild fowl, playing at quoits,—some wholly without marks,—in all stages of the disease their windows daily open,—exposing themselves to the open air in all weathers,"—down to Oct. 29; and on Nov. 5, duly commemorating the "happy Deliverance of the English Nation from the Gun Powder Plot" with tar barrels brought from Marblehead, with which they "displayed a large fire from the Middle of the Island, and the Hospital Illuminated, making a most beautiful appearance." Rockets were ordered from Boston, and were "played off by a number of gentlemen who spent the Evening at the Assembly room," and all passed "very jovially for them and for their friends and acquaintances under Inoculation." Dec. 4, in firing a salute, it does not appear for what occasion, Capt. Lowell of Newburyport, a patient only twelve days under inoculation, blew off both his arms and shattered his upper jaw and nose, yet he was discharged in thirty-seven days, recovered so far as was possible from these and other frightful injuries, with the sight of one eye restored,—a striking testimony to the curative skill and good management which prevailed there. Clergymen were not lacking among the patients to conduct the usual services of Sunday.

Thus successfully did this important undertaking seem to be initiated, and the first, second and third classes, each of a hundred or more members, had already passed the ordeal, the Salem Hospital at Castle Hill having in the meantime been erected and opened. Applications crowded the class books too fast for admission, and the patients, returning from treatment, left the island with

keen appetites, a grateful sense of exemption from future peril, and often in better general health than they enjoyed before entering the hospital.

Unhappily, in bringing ashore a portion of the third class, some irregularity occurred, from an attempt to land them at a point other than that designated by the authorities. The magazine of popular indignation was fired in an instant. General distrust and alarm took possession of the town. Angry collisions occurred. The Hospital Boat was burned. Jan'y 19, four Marblehead men were caught attempting, as it was charged, to introduce into town clothing which they had stolen and brought ashore from the island. "A large body of Mobility" met at the Town House next morning, says the Essex Gazette, and having, "by a great majority, determined that the Mode of Punishment should be Tarring and Feathering," proceeded to execute their sentence.

Of the excesses which immediately preceded and followed this outbreak, we have, besides the contemporary chronicle of the Essex Gazette, which might be thought to be colored by the excitement of the hour, a carefully digested statement, dated Marblehead, February 8, 1774, signed by fifty of the most substantial citizens of the town, and placed on file, Feb. 12, with the Provincial Assembly then sitting at Boston. It bears the names, among others, of Jeremiah Lee, who seems to have drawn it, of Joseph and of William Lee, of both the Glovers, of Richard and Samuel Reed, of Robert Hooper, *tertius*, of Joseph Hooper, of Thos., Thos., jr., and Elbridge Gerry, of Richard Phillips, of Azor and Joshua Orne, of John Gallison and John Sparhawk, of Edward Fettyplace and Burrill Devereaux. It is addressed to "His Excellency, Thomas Hutchinson, Esq., the Honorable, His Majesty's Council, and the Honorable House of

Representatives in General Court assembled." It begins as follows: "May it please your Excellency and Honors. Your Petitioners, being Inhabitants of Marblehead, and conceiving that their Lives, Liberties and Properties have not the least Protection from the Laws and Government of the Land, beg leave to submit their unhappy Circumstances to your wise consideration, and Humbly Implore your Patience to a True Narration of Facts."

From sources of information such as these, unimpeached and thoroughly worthy of credit, it appears that the reign of terror began as early as the night of Jan'y 11, and continued with little abatement until the end of February. That on Jan'y 12, the mob "blacked themselves" after being "plyed with strong liquors for several hours," and beset the house of Jonathan Glover, who planted in the hall behind his open front door a loaded cannon, and declared his readiness to receive their visit. That they broke his windows, and demanded the Deputy Sheriff, Brown, whom they supposed to be on duty in town, to take the offenders who fired the Hospital Sloop the night before. That they declared their intention, so says the petition to General Court, "to have put to a most excruciating death the Deputy, with the High Sheriff, by Boyling them in Oyle." And that "they further embarked to Burn the Hospital, then having forty patients under inoculation, but were happily prevented." The next day, which was the third day, "matters had arrived to such a pitch as to leave it no longer safe for any one to express his dissatisfaction at these proceedings." The disorder increased until Jan'y 15th, when the Proprietors of Essex Hospital made public declaration "that it should be closed until the town should think it necessary to be opened again." This had a quieting effect; but on the 17th, persons appeared blacked, in the evening, in all

parts of the town, and the Design was again disclosed of Burning the Hospital. "Preparation was thought on to defend it," and the design was abandoned. The lives of attendants who came ashore were threatened, and the keys of the Proprietors' stores and warehouses were demanded. Thus matters stood on Jan'y 20. Meanwhile, the first four victims of the tar-kettle had been secured, and, says the Gazette for that day, "the most extraordinary exhibition of the kind ever seen in North America was drawn forth to public view." The procession formed at the Town House in the morning. First came one thousand people, mostly in uniform, among whom were four drummers. Next rode the "four objects of resentment" in a cart facing each other, each wearing a coat of tar and feathers; a fifer and one drummer being placed in the front of the carriage, from which a large white flag was displayed. In this manner they marched to Salem, and entered the town about twelve o'clock. Here, forming a junction with a numerous body of the inhabitants, they paraded the principal streets, drums beating, fife playing, and flag flying from the cart, "which, with the exquisitely droll and grotesque appearance of the four tarred and feathered Objects of Derision, exhibited a laughable and truly comic scene." They left Salem for Marblehead before one o'clock, and dispersed there on their arrival. By this treatment, the petition asserts, the lives of two of their victims were put in peril. The next evening, Jan'y 21, a body of seven or eight hundred persons assembled, tarred and feathered another "object of resentment," and carted him through town, proclaiming that "they had the Laws in their own hands," and threatening all who should exhibit fire-arms, thus "depriving such as apprehended themselves in dan-

ger of their only defence, in a Perfect state of Anarchy and Confusion."

We are not unprepared for the sequel. On Jan'y 24, "a Meeting was called at Marblehead to put a Stop to the Disorders, which for several days before had happened in the Place. As the Dispute respected the Essex Hospital, it was agreed by the Proprietors to shut it up." The account is taken from the Petition and from the Essex Gazette. At their Desire, a Committee of the Town was chosen to inspect the Operation. "Next day, the Committee went to the Hospital and attended their Business until the following Night, Wednesday, Jan'y 26, when they awaked with the Rest of the Family, being eleven in Number, surrounded with Flames. The Ruffians, who perpetrated this act, went from the Town prepared with Tar Tubs, etc., and proceeded setting Fire to all Parts of the House, without any Attempt to awake the People. So infernal were the Villains, that they struck down one Man, who in Amazement had jumped from his Bed and was running from the Flames. The Steward had a Blow from another of them with an Andiron, which missed his head and felled him to the Floor. One of the Patients, with a Child at her Breast, was driven to the Smoke House, fainting as she went, and others were turned out, cold as it was, with scarcely any Thing to cover them."[23]

The persons engaged in this outrage numbered about twenty, part of them disguised as Mohawks; the loss to the proprietors was estimated at Two Thousand Pounds,

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[23] The same issue of the paper states that the Frost has nearly completed a bridge from Castle Island to the mainland in Boston Harbor, that Charles River was frozen over so that there was foot-passage from Boston to Charlestown, that the Beverly Ferry was froze over so that they pass and repass on the ice, and that navigation was at a stand in Salem, the Harbor being entirely froze up.

L. M., and a military watch of forty men was at once established at Marblehead, the Confusion being such that Lives and Property were not thought safe without it.

The General Court was next appealed to, in the petition already quoted. This closed by showing how Reverend Ministers had been abused for bearing religious testimony against the outrages, being threatened with having their houses pulled about their ears; that the Salem Hospital was threatened, and the workhouses, that they should be burnt and the keepers with them; that vessels were threatened with scuttling; and that "should Government remain longer unrestored, assassinations, which have already been threatened, will, we fear, be the unhappy consequence." "Your Petitioners beg leave to shew that, amidst all these Tumults, not a magistrate has there been to command the peace."

In answer to this humble petition for "such speedy relief from these grievous circumstances as in their great wisdom may seem meet," the Provincial Assembly appointed an investigating committee of both Houses, which was instructed to repair to Marblehead and "inquire into the grounds of the uneasiness subsisting there." This Committee reported, Feb. 18, supposing the danger over.

Feb. 25, Deputy Sheriff Brown, of Salem, went in the forenoon to Marblehead and arrested two persons on board a fishing vessel, in an action for £3,000 brought by the "gentlemen who were Proprietors of the late Essex Hospital, on suspicion that the said two Persons were concerned in burning that building. The prisoners were committed to his Majesty's Gaol[24] about 2 o'clock P. M.

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[24] This Gaol was at the corner of Prison Lane, now St. Peter's street, and County now Federal street, and had an open yard on the easterly side of it, extending to Prison Lane. The present residence of Abner C. Goodell, Esq., is in part the same structure and contains some of the identical timbers.

Almost as soon as the Keys were turned upon them, the People began in small Companies to enter the Town from Marblehead, and continued coming over in this Manner, till near Night, rendezvousing near the Gaol. The Magistrates were busy in consulting upon Measures for preserving the Peace, and for dispersing the People who were assembling from Marblehead, from whence a still greater Number was expected after dark. About Sunset, on Application to the Colonel of the Militia, the Drums were ordered out and beat, *To Arms!* Immediately upon hearing this, the Mob to the numbers of 4 or 500, arming themselves with Clubs, Sticks of Wood, etc., and while it was yet Day Light, made a most furious attack upon the Gaol. They first burst open the Doors and broke most of the lower windows in that Part of the Building which is the Prison Keeper's Dwelling,—and then with Iron Crows, Axes, etc., they soon beat their way through four of the Prison Doors, each of which was very strong and well secured with many large Locks. Thus, having got into two Apartments of the Prison, in less than 10 Minutes from the first Onset, they carried off the above mentioned two Prisoners in Triumph to Marblehead."

On Monday, Feb. 28, the High Sheriff of the County (Richard Saltonstall, who had advertised a reward for the apprehension of the jail-breakers) gave orders to his deputy in Salem to command the Inhabitants to meet in School Street (now Washington, north of Essex Street) at 9 o'clock the next Morning, with Arms and Ammunition according to Law, to assist the High Sheriff in the Execution of his Office.

"In Pursuance of this Order, several Hundred were commanded to appear. This Body, when assembled, was to march to Marblehead and assist the Sheriff in

retaking the Prisoners as well as to apprehend the Principals concerned in breaking the Gaol. On the other Hand it was given out that the Marblehead People, to the Number of six or eight hundred, were arming and were determined to repel to the last Extremity, any Force that should be brought against them. In this critical Situation of Things, a Number of the principal Gentlemen of Marblehead were happily instrumental in effecting a Compromise: the Proprietors of the late Essex Hospital being influenced to relinquish all Demands that they might have either on the County or Sheriff, in Consequence of the Rescue and Escape of the above mentioned Prisoners, and to discontinue all Proceedings respecting the Burning of the Hospital. This Measure, which restored Peace, was reported abroad just before the Time at which the People were ordered to assemble, and was the Cause of great Joy and Satisfaction to the Town in general." With the subsequent beating of Clark, one of the four who were first tarred and feathered, and who was again dragged from his bed at night by twenty men and whipped at the post before the Town House in Marblehead, this disgraceful transaction seems to have closed.

Unfortunate as the occurrence was, it barely escaped more serious consequences of a political nature. Such was the sense of outrage on the part of the Proprietors of the Hospital, that they declined all further service in town affairs and threatened to leave town. This action not only vacated the places of deputies in the Assembly, but left Marblehead without a committee of safety and correspondence at that critical moment when, the Boston Port Bill being but a few days off, the second town in New England was about to be called on to render incalculable aid and comfort to the distressed capital of the Province. To avert this catastrophe Samuel Adams made it his special

care and duty, and wrote to Elbridge Gerry patriotic words, which fitly close this strange narration.[25]

Austin says "This act of violence, following soon after the destruction of the tea in Boston Harbor, was urged by the advocates of the ministry as the natural effect of a bad example. To the friends of the people this was peculiarly mortifying. It was with extreme regret that in a place considered as patriotic as Marblehead, a disgraceful scene of riot and ruin should have been exhibited, which could not fail to be turned to their disadvantage in the great contest on which they were entering."[26]

[MR. ADAMS TO MR. GERRY.]

BOSTON, MARCH 25, 1774.

MY DEAR SIR:

While the general court was sitting, I received a letter from you relating to the unhappy circumstances the town of Marblehead was then in; but a great variety of business, some of which was very important, prevented my giving you a convincing proof at that time, of the regard with which I am ever disposed to treat your favours. Besides, if it had been in my power to have aided you with advice, I flattered myself, from the information I afterwards had, that the storm, though it raged with so much violence, would soon spend itself, and a calm would ensue. The tumult of the people is very properly compared to the raging of the sea. When the passions of a multitude become headstrong, they generally will have their course: a direct opposition only tends to increase them; and as to reasoning, one may as well expect that the foaming billows will hearken to a lecture of morality and be quiet. The skilful pilot will carefully keep the helm, and so steer the ship while the storm continues, as to prevent, if possible, her receiving injury.

When your petition was read in the house, I was fearful that our enemies would make an ill improvement of it. I thought I could discover in the countenances of some, a kind of triumph in finding that the friends of liberty themselves were obliged to have recourse even to military aid, to protect them from the fury of an ungoverned

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[25] See Wells's Life of Samuel Adams, Vol. II, pp. 154–5.

[26] See Austin's Life of Elbridge Gerry, Vol. I, pp. 33–42.

mob. They seemed to me to be disposed to confound the distinction, between a lawless attack upon property in a case where if there had been right there was remedy, and the people's rising in the necessary defence of their liberties, and deliberately, and I may add rationally, destroying property, after trying every method to preserve it, and when the men in power had rendered the destruction of that property the only means of securing the property of *all*.

It is probable that such improvement may have been made of the disorders in Marblehead, to prejudice or discredit our manly opposition to the efforts of tyranny; but I hope the friends of liberty will prevent any injury thereby to the common cause: and yet, I cannot but express some fears, that parties and animosities have arisen among the brethren; because I have just now heard from a gentleman of your town, that your committee of correspondence have resolved no more to act! I am loth to believe, nay, I cannot yet believe, that the gentlemen of Marblehead, who have borne so early and so noble a testimony to the cause of American freedom, will desert that cause, only from a difference of sentiments among themselves concerning a matter which has no relation to it. If my fears are groundless, pray be so kind as to relieve them, by writing to me as soon as you have an opportunity. I shall take it as the greatest act of friendship you can do me. Indeed, the matter will soon be put to the trial; for our committee, without the least jealousy, have written a letter to yours, by Mr. Goddard, who is the bearer of this. The contents we think of great importance, and therefore I hope they will have the serious consideration of the gentlemen of your committee.

I am, with strict truth,
Your's affectionately,
SAMUEL ADAMS.

ELBRIDGE GERRY, ESQ.

[COMMITTEE OF CORRESPONDENCE TO MR. GERRY AND OTHERS.]

BOSTON, APRIL 2, 1774.

GENTLEMEN:

Yesterday we received your letter dated the 22nd of March, wherein we have the disagreeable intelligence of your "having resigned the several offices in which you have acted for the town of Marblehead," and that you shall "accept them no more — without material alteration in the conduct of the inhabitants."

When we heard of the unhappy circumstances of that town, the contest that had arisen to so great a degree of violence on account of the hospital lately erected there, it gave us great concern and anxiety, lest it might issue to the prejudice of the common cause of American

freedom. We were apprehensive that the minds of the zealous friends of that good cause, being warmly agitated in such a controversy, would become thereby disaffected to each other, and that the advantage which we have hitherto experienced from their united efforts would cease. We are confirmed that our fears were not ill-grounded, by your relinquishing a post, which in our opinions, and we dare say, in the opinion of your fellow-townsmen you sustained with honor to yourselves and advantage to your country. But, gentlemen, suffer us to ask, whether you well considered, that although you derived your being as a committee of correspondence from that particular town which appointed you, yet in the nature of your office, while they continued you in it you stood connected in a peculiar relation with your country? If this be a just view of it, should the ill conduct of the inhabitants of Marblehead towards you, influence you to decline serving the public in this office any more than that of the inhabitants of this or any other town? And would you not therefore have continued in that office, though you had been obliged to resign every other office you held under the town, without injury to your own reputation? Besides, will the misfortune end in this resignation? Does not the step naturally lead you to withdraw yourselves totally from the public meetings of the town, however important to the common cause, by which the other firm friends to that honourable cause may feel the want of your influence and aid, at a time when, as you well express it, "a *fatal* thrust may be aimed at our rights and liberties," and it may be necessary that all should appear, and "as one body oppose the design and defeat the rebel intention?" Should not the disorders that have prevailed and still prevail in the town of Marblehead, have been a weighty motive rather for your taking measures to strengthen your connexions with the people than otherwise; that you might in conjunction with other prudent men, have employed your influence and abilities in reducing to the exercise of reason those who had been governed by prejudice and passion, and thus have brought the contest to an equitable and amicable issue, which would certainly have been to your own satisfaction? If difficulties stared you in the face, it is a good maxim, *nil desperandum;* and are you sure that it was impracticable for you, by patience and assiduity, to have restored "order and distinction," and rendered the public offices of the town again respectable?

It is difficult to enumerate all the instances in which our enemies, as watchful as they are inveterate, will make an ill improvement of your letter of resignation. And therefore we earnestly wish that a method may yet be contrived for the recalling of it consistent with your own sentiments. We assure ourselves that personal considerations will not be suffered to have an undue weight in your minds, when the

public liberty in which is involved the happiness of your own as well as the children of those who have ill treated you, and whom to rescue from bondage will afford you the most exalted pleasure, is in danger of suffering injury.

We wish most ardently that by the exercise of moderation and prudence the differences subsisting among the good people of Marblehead may be settled upon righteous terms. And as we are informed that the town at their late meeting did not see cause to make choice of other gentlemen in your room in consequence of your declining to serve any longer as a committee of correspondence, we beg leave still to consider and address you in that character.

We are, with unfeigned respect,

WILLIAM COOPER, Clerk.

By order, and in behalf of the Committee of Correspondence for Boston.

*To gentlemen of the Committee of Correspondence for Marblehead.*

The gentlemen addressed resumed their places on the Committee, and so the Cat Island Imbroglio ended.

### AFTERNOON SESSION.

By the polite invitation of Col. William L. Palmer, the lessee of the island and the buildings thereon, the Institute selected this pleasant seaside resort for one of its Field Meetings.

The large hall, erected for the various entertainments incident to these places, was appropriated for the use of the Institute during the day, and here were spread the tables for the lunch at 1 P. M., and at 2.30, the afternoon session was held.

The Meeting was called to order by the PRESIDENT. The records of the last meeting were read by the Secretary, and the usual routine of business was transacted.

The PRESIDENT alluded briefly to the progress that had been made in scientific research, and the increased

facilities for pursuing the same in our various educational institutions within the past fifty years. At that time public attention was being awakened to the importance of these investigations. Societies having these objects in view were organizing, the general government and the legislatures of the several states were making appropriations for scientific surveys of their respective domains, and the same were under consideration.

The introduction of the use of the dredge, the trawl, etc., by naturalists, especially by those connected with the U. S. Fish Commission, has been instrumental in adding largely to the knowledge of the marine fauna and flora of our coast. The arrival of Prof. L. Agassiz in this country, in 1846, marks an important era in the history of science. His lectures before the Lowell Institute, and elsewhere in the United States, created a zeal and interest in zoölogical studies; the formation of the Museum of Comparative Zoölogy at Cambridge, under his auspices, and the great progress in the development of his plans since his decease, by the liberality and persevering energy of his son A. Agassiz, will long remain as a lasting monument to his great and careful labors in this direction. Many of his pupils are now holding professorships in several of our colleges and schools of learning, and are doing good work in the promotion of the natural sciences.

The President then introduced the Rev. Sereno D. Gammell, of Boxford, who made a brief and practical address, in which he compared the vastness of the ocean with the limitless domain of knowledge; but this largeness of the field should not discourage the beginner, for the more one studies, the more he will be interested, and the mind will be absorbed in the research and investigation. He also spoke of the power of self-restraint,

which is an evidence of manliness, as one of the incidental results of studious habits.

Mr. H. Saze, a Japanese student attending the Summer School of Biology, was introduced, and gave an interesting account of the cultivation of rice in a northern province of Japan. The following is an abstract of his remarks :—

The seed is usually sprouted before sowing. This is done by soaking it in water and then exposing it to the warm sun. It is sown broadcast, very thickly over a small patch of prepared soil which might be called a nursery. The plant grows in the nursery until it reaches the height of six or seven inches. Then it is transplanted.

The rice field is ploughed, manured, watered, and thoroughly stirred in early spring. The water must stand about three inches deep. Hence, the necessity of dividing the field into compartments. About the beginning of June, the transplanting commences. The young plants are set out in regular rows of bunches, six, seven, or eight inches apart. Before the plant advances too far in its growth, two or three weedings are usually necessary. The water is finally drawn off. The harvesting takes place during October. The cutting is done with the sickle.

The grain is threshed early in the winter. One handful after another of the straw is taken up, and the grain separated from it. The straw is kept for ropes, shoes, mats, etc.

The chaff is ground off by means of a large wooden or clayey handmill, not heavy enough to crush the kernel. Before it is ready for the kettle, the rice must be further refined by removing the brown inner seed-

coat which adheres very closely to the kernel. A wooden mortar and pestle are used for this final operation.

Dr. George A. Perkins, of Salem, who had lived for nine years in a rice-growing country, gave a detailed description of the method of its cultivation as practised upon the western coast of Africa. This method differed in many respects from that pursued in Japan, and was substantially as follows:

The first step in rice cultivation in Western Africa, is the clearing of so much of the waste land as may be needed for a single year, the natives never planting the same land for two consecutive years. This clearing of the land takes place during the dry season, when all the trees and shrubs are cut down and allowed to dry, and is the most difficult and tedious part of the work. Just before the beginning of the annual rains, the wood, being properly dried by the heat of the sun, the whole tract, often of some miles in extent, is burned over; the intense heat destroying all the weeds, and the ashes being all the manure needed.

This tract of land may belong to a town or perhaps several of them, or even the whole tribe; each head of a family has a portion marked off and assigned to him, and this he divides among his wives, of which he may have one, two, or more.

When the first showers, which usher in the rainy season, begin to fall, the women repair to the farms, provided with rice-seed, a large snail shell—which will hold a pint or more—and a miniature spade; with this last held in the right hand, they dig a shallow hole in the earth, and by a skilful motion of the left hand, which holds the shell filled with rice, they let fall from four to eight grains of the seed into the hole; then, by a single

light blow of the spade, the whole is covered and the same operation repeated over the whole field at a distance of six or eight inches apart.

The planted field must then be very sharply watched to preserve it from the ravages of the small birds who visit the farm in thousands. This business is left to the women and children, but often the men must do their share if they hope to have any rice at harvest-time. This watching must be kept up day after day,—and often at night too, when the moon shines,—until the plant has so far grown as to cease to attract the birds. When the rice begins to head, it must again be guarded until it is fit to cut. This cutting is a tedious work, only one head is cut at a time; upon this they leave the straw about eight inches long, and this enables them to tie it in bundles just as large as the hand can grasp. Five of these handfuls are afterward again tied together to make a larger bunch. One of these large bunches seems to be the unit of measure in dealing with one another.

All the crop is to be transported on their heads from the farm to their fenced towns, a distance in most cases of two or three miles; it is there stored in the tops of their conical huts, where it is exposed to the smoke of the fires on the earthen floors below, and this preserves it from the attacks of insects.

When wanted for food, only a single day's rations are cleaned and cleared of the hulls at a time, by pounding in large wooden mortars, and the chaff is fanned away.

Prof. E. S. Morse, after alluding briefly to the peculiar difficulties of the Japanese language, spoke of the great rocks with which the shore is lined, and which here and there dot the island. It was with reference to the effect upon them, of the glacial period, that explanation was made. Many years ago, the entire country

hereabouts was covered with a vast field of ice, which gradually moved southward. One of the evidences of this moving field of ice is the rounding of the large stones all over New England toward the north, and their ragged precipitous character towards the south; also the presence of bowlders which evidently do not belong to this region. Reference was also made to the glaciers of Greenland and Switzerland.

Prof. Morse exhibited specimens of the *Pupilla muscorum*, which he had found on the island during the day, and considered this a new locality for this species. A communication prepared by him since the adjournment, on "The gradual dispersion of certain Mollusks in New England," contains a description of this *Pupilla*, and is appended to the report of this meeting.

Rev. Joseph Banvard, of Neponset, formerly pastor of the Central Baptist church of this city, made some excellent and practical remarks regarding the possibility of every one being able to gather much scientific knowledge, by keeping the eyes open and cultivating the habit of close observation. He urged the young people present to study the simple things in nature, and in so doing, they would not only find great pleasure, but great profit.

Mr. N. A. Horton, of the Salem Gazette, after a few appropriate remarks, offered the following resolution which was unanimously adopted.

*Resolved*, That the thanks of the Essex Institute be tendered to Col. William L. Palmer, for his polite invitation to hold a field meeting on Lowell Island, and for the courtesies extended to the members and their friends on this occasion.

Adj.

## *The gradual dispersion of certain Mollusks in New England.*

By Edward S. Morse.

The rapid dispersion of Mollusks, as observed in certain species, is of great interest in connection with the general distribution of species from certain centres.

The rapid invasion of large areas, by species not known to have occurred there before, may account for the wide distribution of species through certain geological horizons, where their progenitors in earlier deposits are not known. The sudden appearance of species throughout large geological areas has always been held as a strong point by those who argue against the doctrine of derivation.

In a long study of the Mollusca of New England for the past twenty-four years, I have observed many changes going on in the distribution of certain species which indicates a much more rapid invasion of areas than had before been supposed. Not only do we see this rapid introduction of forms from other centres, but some species of mollusks vary greatly in their relative scarcity and abundance, when observed over considerable lapses of time.

In my little work entitled "Observations on the Terrestrial Pulmonifera of Maine," forming the first part of the Journal of the Portland Society of Natural History, published in 1864, I commented on this change in the relative scarcity and abundance of certain species as compared with the observations made by Dr. J. W.

Mighels, a careful and enthusiastic worker in the same field. His paper was published in the Proceedings of the Boston Society of Natural History in 1843, and was entitled "Catalogue of the Marine Fluviatile and Terrestrial Shells of the State of Maine" (Bost. Jour. Nat. Hist., Vol. IV, p. 308). The following is a brief extract from my paper above mentioned. The lines in quotations being taken from Dr. Mighel's paper, while the contrasts as observed by me are printed in italics.

Mesodon albolabris. "Solitary." *Great abundance.*

Anguispira alternata. "Abundant." *Not abundant, except on islands.*

Hyalina indentata. "Appears to be rare." *Not rare.*

Hyalina electrina. "Rare." *Quite common.*

Conulus chersina is more abundant than his words would seem to indicate.

Strobila labyrinthica. "Found sparingly." *Common all over the State.*

Pupillas and Isthmias. Were noted as found sparingly by Dr. Mighels. Most of the species are quite common.

Zoögenetes harpa. Is now abundant in several parts of the state, and particularly about Portland. Mighels did not find it at the time of the publication of his catalogue.

Succinea avara. Mighels mentions only one locality. It is now common all over the state.

Helisoma bicarinata. "Not aware that it is abundant anywhere." *Exceedingly abundant.*

Ancylus rivularis. "Found in plenty." *One of our scarcest shells.*

Radix ampla. This species was found in great abundance when first discovered in Eagle Lake in the northern part of the state, in company with *Physa ancillaria.*

In company with Mr. John M. Gould, I visited this lake in 1859, and a most careful search revealed only a few dead specimens of *R. ampla*, and not a vestige of *Physa ancillaria.* Mr. Fuller has since discovered the shell on the shores of Lake Sebago.

Dr. C. B. Adams first described a species of land snail known as *Pupilla badia*, as occurring in Vermont. The shell differed very slightly from a European species *P.*

*muscorum*, and as such Adams' species is now recognized, though I have already pointed out some slight differences in the two shells. Since Adams' discovery of the species, in this country, it has been found on certain islands in the Gulf of St. Lawrence, as well as in New York State. In the year 1862, Mr. Charles B. Fuller found it in Maine, near Portland. In some localities near that city, known to have been examined by early collectors without meeting with it, it has been collected by thousands. At Oak island, Chelsea, a famous collecting ground of Dr. Gould, Dr. Binney and others, no evidence of the existence of this species there is recorded. In the year 1860, Prof. W. C. Cleveland found it in the greatest abundance. In this case it can be positively asserted that the species has been introduced within twenty years. The collectors of Salem and Lynn had failed to observe its occurrence in Essex County. Last summer I discovered the species in great abundance on Lowell island in Salem harbor. From these evidences it is quite certain that this minute land shell is being distributed with considerable rapidity.

It will be found that, as in the case of plants, the land species of mollusks are being widely distributed through railway traffic. I have often found, at Portland, minute land shells clinging to firewood that had been brought from the interior of the state.

The remarkable rapidity in the diffusion of *Littorina litorea* is of special interest in this connection. This well-known European species was first observed on this continent by Mr. Willis, of Halifax, N. S., many years ago. Since that time, it has been rapidly and widely diffused along the coast of New England.

In 1870, Mr. Fuller found a few specimens in Portland harbor, and about the same time at Kennebunk in Maine.

It is now found in great abundance along the coast of Maine.

Before the year 1872, it had never been observed in Salem harbor. On the shore of South Salem, a place where I had repeatedly collected, only a single specimen was found in the spring of 1872. It is now one of the most common shells in the harbor of Salem, and actually swarms in countless numbers in all the inlets in the vicinity of Salem.

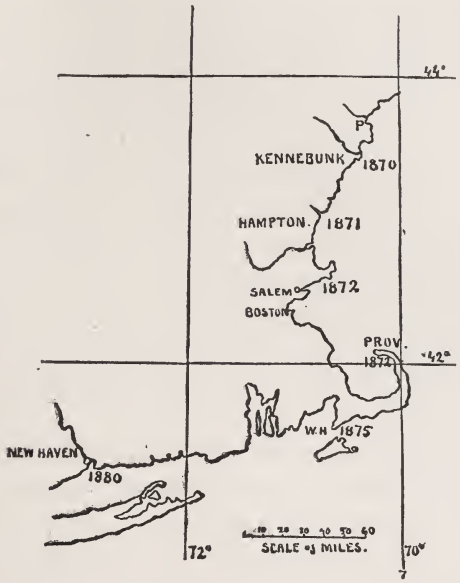
Professor Verrill, in a note to Silliman's Journal, for September, 1880, records his observations in regard to its diffusion, from which we quote the following:

"In 1873, it was collected in abundance at Saco, Me., by the U. S. Fish Commission, and was found sparingly at Peake's island, Casco Bay. In 1872, it was very rare at Provincetown, Mass., but in 1878, it was common there. In 1875, it was collected by the writer at Barnstable, Mass., on the shores of Cape Cod Bay, in large quantities. In 1879, it had become exceedingly abundant at Provincetown. In 1875, our parties found two specimens only on the southern shores of Cape Cod at Wood's Holl, but in 1876, it was found to be common there, and is now very abundant. The first specimen, found so far westward as New Haven, was obtained by Professor S. I. Smith, during the past winter. Other solitary specimens have since been obtained here by Mr. E. A. Andrews and by J. H. Emerton. It is at present exceedingly abundant at Newport, R. I."

In "Science News" for April 15, 1879, Mr. Arthur F. Gray comments on the occurrence of this species on the New England coast and gives a large number of places where it has been collected.

He first found it in Massachusetts, at Danvers, in the spring of 1872. He also mentions that Prof. J. W.

Chickering, jr., found it at Hampton beach, N. H., in 1871. The following rude map illustrates the gradual dispersion of this species from Maine southward, with the year of its occurrence marked at the different places.




EXPLANATION OF MAP.

P., Portland, Maine; PROV., Provincetown, Mass; W. H., Wood's Holl.

In 1872, it was observed simultaneously at Salem, Mass., and Provincetown on the end of Cape Cod. This Cape seemed to form a barrier for some time to its passage south, and after rounding the Cape, its progress was much slower. Its occurrence at Wood's Holl being observed in 1875, and only the past year had it got as far as New Haven.

A study of the ocean currents north of Cape Cod, which have a southerly course, will account for the rapid dispersal of this mollusk from Maine to Provincetown, Mass.; while the currents which set easterly south of

Cape Cod will account for its slower dispersion along the Connecticut shores.

It seems somewhat remarkable that this mollusk, for so many years an inhabitant of Nova Scotia and the Bay of Chaleur, should have been so long finding its way to the State of Maine. As far back as 1855, I received specimens of this species from Bathurst in the Bay of Chaleur.

The conditions are evidently very favorable for its existence along our shores, for it has increased in countless numbers, and the species seems to be fully as robust, and oftentimes exceeding in size its relatives in Europe.

Mr. Gray calls attention to the fact that this species, known under the common name of "periwinkle," forms an abundant supply of food to the poorer classes in Great Britain and Ireland, and there is no reason why the poorer classes here should not avail themselves of a mollusk so easily obtained.

Believing that, in past times as at present, the dispersion of forms took place in similar ways, it is interesting to look ahead to a time when the present mud and sand of the shores shall have been converted and consolidated into stratified rocks with the species entombed in a fossil condition. We may imagine a future Barrande finding material for an onslaught on the derivative theory by pointing to the abundant occurrence of this species in a narrow bed of rock of the same horizon and occurring over hundreds of miles of territory, when the beds just below reveal no vestige of this large and vigorous species.

Littorina litorea, *Linn.*

## Excursion to New Castle, N. H., Friday and Saturday, September 10 and 11, 1880.

The circulars, that were previously issued, announced that the excursionists would leave Salem on Thursday, the 9th inst., at 1.10 p. m., with the proviso of a postponement to the day following, if the weather should be unfavorable. Owing to the prevalence of a storm, the departure was deferred, and the party left on Friday, by the Eastern Railroad, reached Portsmouth at about 2.30, and at once took carriages to New Castle, making the Wentworth House, their headquarters. At the time of leaving Salem the weather had not entirely cleared, though indications were favorable and soon after the arrival at the place of destination, hopes were realized by the lightening up of the western sky and a glorious sunset was observed from the piazza. The effects of the storm were visible in all directions,—the dashing of the waves against the rocks, or rolling in on the beaches,—the wreck of a vessel breaking up, etc. Schooner *Eddie F. Hodgdon*, wood and slate laden, bound from Bangor to Boston, was compelled to anchor off Frost's Point, parted her cables, and the day before at noon drifted ashore, and became a total loss.

An evening session was held in the large music room at 8 o'clock. The President, in his introductory remarks, spoke of the great pleasure of coming to this old historic town, around which cluster so many interesting associations connected with the colonial and provincial periods of our history. These have been well described in the "Rambles about Portsmouth," by the late Charles W. Brewster, the first series published in 1859, the second in 1869, after the decease of the author. He alluded

to the meeting of the Institute held at Kittery, Me., on the other side of the Piscataqua river, in August, 1867; to visit, among other places of interest, the mansion once owned and occupied by Sir William Pepperell, the wealthy and enterprising merchant of the middle of the last century, who by his means and individual services contributed so largely to the capture of Louisburg, and was rewarded for his success and bravery with a baronetcy by George II.

In many of the old towns on the New England coast, the children, from the early settlement to the present time, have been wont to leave the old homesteads to colonize new places, or to seek the centres of trade, commerce or manufactures. We find them scattered over the vast territory extending from ocean to ocean, and from the Lakes to the Gulf, actively engaged in the various duties of life. Some visit the home of their ancestors and delight to examine the old records, and by diligent research and careful study endeavor to clothe in living forms this dead past. The collecting, arranging and preserving of the old papers and other relics, that will facilitate these researches, come within the province of the Institute.

Copies of extracts from some of the old documents in the office of the Registry of Probate for Essex county, were read to illustrate their character and the extent of the valuable material for history that may therefrom be gleaned.

Vice President F. W. Putnam was then called upon and gave a brief account of the Pueblo Indians of New Mexico and Arizona, illustrating his remarks by a series of large photographs taken by the government expeditions under Major Powell and Captain Wheeler. These

photographs showed the peculiar character of the houses, which consist of a number of rooms, placed side by side, and one over the other in three or four receding stories, the people living in the upper and outer rooms, while those which are dark and covered by others are used as storerooms. He showed how this plan of house-building had evidently been adopted as a means of defence, and how strongly fortified a town thus built was before the days of powder and artillery. The method of entering these houses was by placing a ladder from the ground to the roof, and so on from roof to roof. When the ladders were drawn up, the people were in comparative safety, and so long as provisions and water held out they could easily defend themselves before the days of gunpowder. These groups of houses often contained from 500 to 1,000 or more people; and while some, like the Pueblo of Taos, were built on the lowland and surrounded by an earth-wall, as a further means of protection, others, as the Pueblo of Acoma, were on high table-lands, or mesas, several hundred feet above the surrounding country, and could only be approached by narrow paths, which could be easily defended, when bows and arrows were the principal weapons. Some of these towns were, however, taken by the early Spanish leaders, and we have accounts of them as far back as the time of Coronado, about the middle of the sixteenth century. The Pueblo of Acoma, in particular, is interesting from the fact that it stands to-day, apparently unchanged, as it was first seen nearly three and a half centuries ago. The Pueblo of Zuñi is perhaps the best known of the southern towns in New Mexico, but as the present Pueblo, or New Zuñi, was built after old Zuñi had been taken by the Spaniards, it is of comparatively modern origin, although the people have, to a considerable extent, retained the

purity of their customs. The Pueblo of Taos, near the Rio Grande, has been often visited and described.

About Santa Fé, on both sides of the Rio Grande, there are many old pueblos, some of which are in ruins, while others have been, in great part, changed to Spanish-Mexican towns. In a few, however, the original inhabitants are still in the ascendancy. In many of the cañons and smaller valleys, and on many a mesa in New Mexico, Colorado and Arizona, as well as in southern Utah, and also to the south in Mexico, there are numerous ruins of once extensive towns, many of which have been described in the accounts of the various military and exploring expeditions. The "seven cities of Cibola," discovered by Coronado, have often been mentioned, and some writers have supposed them to refer to the ruins found by Lieut. Simpson in the Chaco cañon, a tributary of the San Juan, but the lecturer was inclined to argue with those writers who placed these "seven cities" in the region about, and including, old Zuñi.

The hundreds of ruins which are now known, including the singular cliff-houses or fastnesses, furnish the evidence of the former greatness of the pueblo people, and their wide distribution over a region which was probably once better adapted than now for the support of human life.

The lecturer then gave an account of the arts of the pueblo people, calling particular attention to the character of the pottery, of which he exhibited a number of specimens. This pottery differs widely from that found in the mounds and in other parts of the country to the east of the pueblo region, and is of a better type. That found about the ruins and belonging to the early period is baked harder, and in structure and ornament is far superior to that now made at the pueblos on the Rio Grande. That made at Zuñi, and the other southern pueblos, is more

like the old. The ornamentation is in color, generally black on white, or on red; occasionally a piece is found among the old fragments that has a glossy, bronze-like color. The decoration on the old pottery is principally made up of zigzag or geometrical figures; occasionally curved lines and scrolls were used. On the pottery now

FIG. 1.

COIL-MADE JAR FROM AN ADOBE RUIN IN SOUTHERN UTAH.

FROM A SPECIMEN IN THE PEABODY MUSEUM.

made at the pueblos on the Rio Grande, the ornamentation is more often black on a red ground, and many figures derived from contact with civilization have been introduced. On the recent pottery, animals are often rudely represented. The recent pottery is not so well baked as the old, and is in every way of an inferior character. A common method of making one kind of the oldest

pottery was by coiling the bands of clay upon themselves, and leaving the edges projecting. Pottery of this character is often farther decorated by pinching the edges, or by marking with the finger nail, or with a stick. A jar made in this way is shown in the engraving here intro-

FIG. 2.

PATTERNS ON ANCIENT PUEBLO POTTERY FROM THE SAN JUAN VALLEY.

FROM SPECIMENS IN THE PEABODY MUSEUM.

duced[1], fig. 1; and some of the common forms of ornament on the smooth pottery are shown on the fragments represented by fig. 2.

[1] These illustrations were prepared for an article on Pueblo pottery in the Art Review, and by the kindness of the publishers of that journal, Messrs. Estes & Lauriat, of Boston, their use is allowed in this place.

After Mr. Putnam had closed his remarks, the company adjourned to the parlors where several choice selections of vocal and instrumental music were finely rendered by members of the Salem Oratorio Society and the Salem Schubert Club.

On Saturday morning the sun rose clear and bright, and the party during the forenoon rambled about in various directions as inclination dictated. Several interesting places were visited: Odiorne's Point where M. Champlain landed in 1605, and the place selected by the Laconia company for the site of the first building erected on the grant, and it should therefore be venerated by every citizen of New Hampshire for the associations that cluster around this beginning of the state. At Frost's Point a fort was built soon after the settlement called Fort William and Mary; in 1775 fortifications were thrown up, and in the fort a company of artillery was stationed. In 1808, it was rebuilt under the name of Fort Constitution and remained until a new structure was commenced in 1863.

The lighthouse, the village, the village church, the burial ground,—were all noticed. New Castle is situated at the mouth of the Piscataqua river, at the entrance of Portsmouth harbor, some three miles from the city, formerly known as "*Great Island.*" It was settled in 1623 and was a part of Portsmouth. In 1693 it was incorporated under its present name. The charter under the seal of William and Mary, written on parchment in old English black letter, is said to be still in the archives of the town. This was the home of the Jeffreys, Atkinsons, of John Frost who married Mary, sister of Sir William Pepperell, a family of the Prescotts and other honored names.

At 3 P. M., adieu was said to mine host of the Wentworth House; the delightful situation, picturesque scenery and surroundings, with first-class hotel appointments, have given to this house a prominent place among the seaside resorts of New England. On the way to the railroad station in the city, tarried for an hour at an old mansion,

THE HOMESTEAD OF GOV. BENNING WENTWORTH,

who built it in 1750, and occupied it until the termination of his commission in 1767. Situated at Little Harbor about two miles from the centre of Portsmouth near the bank of the river, it commands an extensive view of Portsmouth, the navy yard, and adjacent and opposite shores.

Mr. William P. Israel, the present owner, conducted the party through the several apartments, pointing out the various objects of interest and referring briefly to some of the old historical associations. The following may be specified:

The council chamber, finished in the best style of the last century, an imposing and high-studded room, where meetings of the council were held, for many years; also the little side rooms. Ascending a short flight of steps is the spacious parlor, rich in its original finish.

In these various rooms were collected many interesting and curious objects; pictures, a spinet, furniture, etc., that would require considerable time to, carefully, examine. The most notable of the pictures was a painting, by Copley, of Dorothy Quincy, who became the wife of John Hancock, and afterwards Madam Scott.

Leaving the old mansion, the party proceeded to the cars and took the 5 o'clock train for Salem, arriving at 6.35 in the evening.

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OF THE

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## VOLUME XIII.

1881.

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# BULLETIN

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TUESDAY, DEC. 14, 1880.

## MEMORIAL TO JONES VERY.

THE memorial meeting to commemorate the life and services to literature of our distinguished townsman, Rev. Jones Very, the poet, was held in the rooms of the Essex Institute this evening. The meeting was called to order by the President, Dr. Henry Wheatland, who said:

This is a special meeting, called at the request of several members. The object was stated in the call.

A visitor to Ship Rock in Peabody, the famous bowlder now owned by the Essex Institute, should he extend his ramble, on some pleasant summer's day, farther along the brook, half a mile or so, to Cedar Pond, he will observe the ruins of an old cellar with stones scattered around covered with vines, a few moss-covered apple trees in the midst of a growth of oaks and pines, the old well now covered with a stone, and the road long discontinued and overgrown with woods and shrubbery, scarcely discernible. Here Bridget Very, at an early period in our history, with her two sons and a daughter settled, and with strong hands and brave hearts cleared the land and made for

themselves a home; and for several generations members of this family cultivated these acres, until a desire for a change or otherwise prompted them to remove elsewhere.

Similar indications may be noticed, in rambles through the woods in this vicinity, of a previous occupancy by some of the old settlers; the depression in the earth, vine-covered rocks scattered around, and a few plants that follow in the footsteps of man, still linger and seem to flourish amidst those indigenous to the soil. The construction of new roads, and the discontinuance of some of the old, probably necessitated this change. It is not our intention this evening to give a sketch of the family,— this has been done, in part at least, by other hands,— but to present to your consideration several communications, verbal and written, commemorative of the life and service to literature of a descendant, who was a fellow-townsman and one whose familiar form we had long been accustomed to see in our streets and at the meetings and gatherings of the Institute; though dead, his works survive and will long keep his memory green.

### REMARKS OF MR. ANDREWS.

The PRESIDENT then introduced Mr. William P. Andrews, who spoke of the familiarity of the audience with Mr. Very's personal appearance, recalling the many occasions upon which they had seen him enter the hall in which they then were, and modestly seat himself at the feet of men greatly his inferiors in intellectual and spiritual attainment. A remark of Mr. Charles T. Brooks was alluded to, to the effect that Mr. Very's townsmen had seen him so often they had become perfectly familiar with the *stalk*, but extremely few knew the beauty of the flower. Mr. Andrews expressed the hope that something

of its fragrance might have escaped, as it were, into the paper he then read on the "Life and Spiritual Experience of Jones Very, the Poet."

The status of Salem as an entry port for East India merchandise at the time of Mr. Very's birth, on the 28th of August, A. D., 1813, was briefly referred to, and a tribute paid to the worth and intelligence of her shipmasters.

Some account of "Capt." Jones Very, the poet's father, was then given, and of his mother, Lydia Very, a daughter of "Capt." Very's uncle, Samuel Very, who like his nephew commanded one of the vessels sailing from Salem. Mention was also made of the poet's brother, the Rev. Washington Very, his sisters Miss Frances E. and Lydia L. A. Very; and of the interesting fact that "Capt." Very himself and all the members of his family were fond of verse-making, some of which had shown decided literary talent.

The facts of Mr. Very's early life were then rehearsed; his voyages to Russia and New Orleans with his father when a lad of nine or ten years of age; his father's death, which occurred in December, 1824, and young Jones's provident care of the family. His service as store boy in an auction room was then spoken of; his gravity of demeanor, and his faithfulness to the duties devolving upon him in a distasteful occupation. His intense love of literature was related, and the means by which he obtained the books he needed to fit him for college, in the course of the business in which he was engaged. It was then stated that Mr. Very prepared himself with great rapidity and thoroughness, and entered Harvard College in the last term of the sophomore year, 1834. It was said that Mr. Very was unusually mature at this time, and that his most intimate associations were mainly among the older residents of Cambridge and the instructors, all of whom esteemed him highly. He graduated in 1836, next the

head of his class, and was appointed a tutor in Greek, studying meanwhile at the Divinity school, whence he never formally graduated, owing to ill health, but returned to Salem in 1838. He was, however, duly licensed as a preacher by the Cambridge Association in 1843.

Accounts of persons then studying in Cambridge were given, showing the deep impression of mental and spiritual power which Mr. Very made on all with whom he came in contact; and the great rapidity and fluency with which his noblest sonnets were produced (mostly at this time) were alluded to.

The warm and personal friendship existing between Mr. Very and Mr. Emerson, R. H. Dana, the poet, and other distinguished men, and the exalted opinion they then had of his worth as a man, and of his "extraordinary" merit as a poet, were then shown by copious extracts from letters written about or to Mr. Very by the gentlemen named, including an account of Mr. Emerson's assistance in the preparation of the little volume of "Essays and Poems by Jones Very," published by Little & Brown, at Mr. Emerson's personal solicitation in 1839.

The unique state of great spiritual exaltation under which Mr. Very produced this work was then detailed at length; from accounts given at the time by Rev. Dr. Channing, Mr. Emerson, Rev. Dr. Clarke, Miss Elizabeth P. Peabody, and others, showing that Mr. Very's mental powers were stimulated to great activity, by his belief that he had surrendered his own will to the will of God, and become a passive instrument of the Divine Spirit. That Mr. Very had not lost his reason, as was at the time alleged by persons unacquainted with him, was amply proved from the same sources; all the persons named uniting in pronouncing him profoundly and even exceptionally sane.

His religious convictions were illustrated by frequent

and extended extracts from Mr. Very's own poetry, some of which was also quoted at length, to exhibit his intense and absorbing love of Nature, both for her own sake and as a Divine Interpreter to man.

The prose essays, included in this early volume, were spoken of as having great merit, and as being distinguished by much of the melodious movement which marks the lyric quality of Mr. Very's verse, for which latter, Bryant, Emerson, Dana, and many other excellent judges have predicted an immortality. It was suggested that Mr. Very's writings had lent a spiritual and personal interest to the scenery about Salem, which would prove a worthy complement to the historic and romantic pageantry with which his friend Hawthorne's brilliant imagination had already filled its streets.

A warm tribute to Mr. Very's worth as a man was quoted from a personal letter by Rev. R. C. Waterston, his life-long friend, and the fact of his death at Salem on the 8th of May, A. D., 1880, related.

Mr. Andrews concluded by remarking that though all that was mortal of Jones Very had ceased from life, his work had hardly yet begun its mission. His poetry would long remain a gushing brooklet, bringing cheer and refreshment to many weary lives. His gentle spirit still sheds its benediction upon all who were fortunate enough to know him; an influence that will remain unforgotten, while his favorite the Windflower blooms with a "meek, confiding grace," that fitly typifies his spirit, or his kinsfolk the columbines still nod and beckon from their "craggy hill."

### MR. SILSBEE'S REMARKS.

*Mr. Edward A. Silsbee,* being called upon, spoke substantially as follows:

I intend to speak only as to Mr. Very's literary excellence and place. Single as he was in his own literature, I would be as single in the purpose and end of these remarks, and with some variety of illustration,— to talk about poetry with Mr. Very as text.

The American loves the superlative. Amid endless surroundings, it is easy to see why. His language stretches after a reality which is ever fleeing before him. He lives in the midst of boundlessness and his words labor after its conceptions. By a natural sympathy, limitless vistas, physical and intellectual, slip into the atmosphere of his mind. Words of unbounded meaning alone fit his emotions. The continent swells in his speech. He is the most unfettered creature ever put upon the earth, the last heir of time, he believes the final. If I follow the national bent of sweeping assertion and emphatic statement, I shall only be patriotic and very natural.

Cut off from the past which is poetry, we become imitative. Our intellectual home is England or the old world, stretching back through literature and life to antiquity and the bible. We have none of it. We are raw, we are digging the foundation of a new civilization to correct and abolish the errors of the old. There is no superstructure yet. We have just begun. We are imperfect germs sloughed off to manure the future. Everything is tentative here, inchoate.

Our people are impressible, have an artistic temperament more than the English. They are poetic, romantic, we are not. Nothing in our bare, mercantile life, just scratching the continent, yet makes us so. No associations disturb the dream of the merchant's life. The mind of America is mercantile perforce; how can it be otherwise? There is no variety in class, history or

power. The continent subdues man. Nature is too vast, the temptation too great. Civilization is practical. No race ever had such well-being and opportunity. We have a temperament outrunning our genius yet, but it will come. Our heads, our types, prefigure a bigger man than we are, and a more delicate woman. Genius, delicacy, rareness, we shall have them. The world has not labored in vain and travailed for five thousand years to produce us, to have us a failure. Robustness we must get and fibre. My theory is mixture of stock to give it to us; German mind and Irish temperament, with Anglo-Saxon character as base.

I say to English people the greatest thing they have done is to produce America, and so it is. If the genius in poetry is not transmitted here, the genius in the sister arts seems likely to come. We shall probably be great in art,—architecture, music, painting,—before we are in poetry or prose. Architecture has the greatest future; an immense field is here, endless wealth and enterprise, such as created Athens, Rome, Florence, Venice. The religious impulse is wanting which did the greatest things; civil and humane motives may supply its place. There is a religion of humanity, one side of religion, use and beneficence.

We can wait for literature. It will be the better for the waiting. The American nature is not knit yet, as Burke remarked a hundred years ago, nor the character formed. We are thinned-out English needing enrichment. This is shown in poetry, a sensitive proof; it is not sustained, masculine as the English is, nor is criticism. It stumbles and falls away from the points it reaches. For the fitting America, literature, art, life, we shall have to wait. They could not come now, and better not. We are building slowly, barely laying the founda-

tion, money fiends let loose in a continent. Puritan intensity goes to trade. The American hero is a rich man. Formerly it was "King" Hooper in Marblehead and Derby here. Now it is Vanderbilt and Stewart in New York, and Bonanza kings on the Pacific. They sway the continent and shake the markets of the world. A curious thing it is, the richest men are not Americans — of English stock — Astor, Girard, Vanderbilt, Stewart, Mackay. We are beaten in our own field. The richest man in the world is a Jew. We devote more talent to getting money than any people, but we spend it more freely, and are less mercenary than Europeans. We are generous and live on a scale they don't know. The American is ashamed of economy. He thinks it belittles him. He is barbarous.

The influence of materialism here is great and undue, because it is a new country, as is commonly recognized. There is no tradition, no past, no romance,—that is all in Europe, speaking broadly. It is not worth while to go on sentimentally about this, or to make it too much capital in trade as literary men do sometimes, James for example. Hawthorne took note of it. Emerson has fought it all his life. Irving made much of the old world.

With this enormous weight of material civilization to contend against, we can fly to nature as Very did instinctively. Look at our chequer-board cities and absence of all past. The past is as needful to man as the future. We destroy it as soon as we make it. We have to seek it in Europe, which is to us what Greece was to Rome, the source of the more æsthetic culture and refinement. The past never tempers our lives or appeals to our imaginations. It is the future. Everything is painfully new and does us harm, makes us material. We are carted off and dumped down into every new

state we form. We are incessantly thinned out to fill up the West. The seaboard is a sieve.

The Ohio New Englander is greater than his ancestor, the best type of American, midway east and west. He is more in the mould of Washington. The centre has shifted westward. The only great man New England produced, world-wide man, was Franklin. He had to be hurried out of New England before he was of age. It is impossible to conceive of Franklin having grown up, been bred, and filling out his career in Boston—the most antique man we have had, a pagan as big as Goethe. New England is the indispensable influence, not the basis.

With all our vastness, we are colonial, provincial; crude for that very reason; too widespread to ripen and grow mature on our own ground and by our own figtree. We cannot be at home in three thousand miles of continent and in forty states, each sovereign. It is like loving a parish. There cannot be more than a certain number of brothers and sisters. You cannot fold the human race to your bosom, though the Mormons stretch things in this way I suppose.

The whole American poetry is not equal to one great English poet, and would not be missed if lost to-morrow. Not to speak of Chaucer, Spenser and the whole great roll, we have no Wordsworth, Byron, Shelley, Keats, Scott, Coleridge, Dryden, Gray, Pope, Thompson nor Moore,—not a man to set beside them. Our poetry is in a hopeless minor key, has pleasing notes, no new harmony; has never displayed a new phase of imaginative feeling and an accompanying freshness of form, the poet's own. It is not a great part of literature, hardly a brick to put into the edifice of English poetic literature, we think not one. He is a poet who stands for something distinctively his own and cannot be missed in English lit-

erature. Now Very in his fine way comes as near to this as anybody. It is but a note, a very little note, but it is a note contributed to English literature.

Our poets bear the same relation to universal literature that English art bears to universal art. We need not be startled therefore; all English art is not equal to one old master, in painting or in music. They are absolutely without great genius in music and painting. Why these gifts are given to nations who shall explain? Why the Spaniards alone are like the English for underived genius, —Don Quixote, the ballads, Calderon?

Our poets never strike the note of passion, of fire, except rhetorically, they have enough of that. It is sophomoric. The class books were full of it when I was a boy, and how we tore the passion to tatters and emphasized it! Rhetoric is a stage as natural as measles. The West is grossly afflicted this way. We are saved by comparative old age. The American eagle has a bold flight, but is a vapid bird. How we delighted in this:

> "There's a fierce gray bird with a bending beak,
> And an angry eye, and a startling shriek."

Or in this:

> "At midnight in his guarded tent
> The Turk was dreaming of the hour."

Still better:

> "Aye, tear her tattered ensign down
> Long has it waved on high."

This is rhetorical inspiration, not poetic passion. It is as different from poetic passion as the singing voice from the natural. Natural feeling we have enough of, no race has more or so much. In no race is there such humanity. The American is the sweetest man in the world through the influence of woman, the family relations, which lie at the root of character. The English are brutal, the French

selfish, the German stolid and coarse. We are gentle and refined beyond any European precedent and owe it to republicanism and the sex. This alone makes up for heaps of poetry and art, and what a basis of civilization!

They are never lifted and lost, our poets, never moved to the centre, the passion is never torn out of them as it is in Wordsworth, Cowper, men of calm temperament. They are never wrought upon till the fire flies as sparks from living coal. We have no ode nor elegy, except Emerson's "Threnody" be one, yet if I am right it has not the passion of sentiment. From Chaucer down, the English have been susceptible of exclamations. We have not one, only rhetorical such as I have quoted. This rhetorical stage is natural to a young people with nature at hand to inflate them and stretch their note to bursting.

Our poets survey nature without ecstasy. They have never had the fine frenzy. When one will write a soul-stirring lyric to the bobolink, such as the English poets have written to the skylark, or be touched by one great feature of nature and celebrate it in immortal verse, I will believe in American poetry. The piece coming nearest to English writing in this kind seems to me Bryant's "Water Fowl," which has grace and distinction if not passion. "Wilt thou not visit me" of our own poet has something of the same note.

Our poets make literary capital out of nature, catalogue her. Why they are so barren in emotion, according to Taine's manner of accounting for such phenomena and characteristics, is not far to seek perhaps,—Puritanism and a new land. Civilization is a very complex affair and depends on the past as on the future. Our past is in Europe. We are violently cut off from it. It is our intellectual birthright. Our intellectual home is there. Hence crudity, commonplace here, which is colonial and

natural. We are not allowed to grow old, to mature. We sift into the continent and sag, and drift and settle westward. We are shifty and Arab-like and not attached much to place. The mind itself is just as little at anchor. Too scattered are we to grow old or keep each other in countenance. Fifty million is a thin plaster of population for a continent, one Liverpool and Manchester extending to the Pacific. The wonder is we are as intelligent, refined and civilized as we are. We are digging and planting the continent and putting in the iron nerves of railroads. That is our function. Commonplace in literature suffices, something easily read as you run. We have time for nothing else. Newspapers are our literature, thin pabulum, but better than nothing for busy millions.

Nature is the cathedral of the future and Wordsworth and Very are its prophets. Byron got this note from Wordsworth. Wordsworth is the John the Baptist to some faith to be, which the world is building up. He certainly builded better than he knew. This sentiment for nature is our great refuge from all actuality and every other lack we suffer from. It is the modern education of mankind, and we have it here. It is a new sense which can dispense with the picturesque and romantic. It is forming literature, art, life and creed.

Solitary rapture with nature such as Very felt, fortifies the soul against materialism in this dense commercial air, and is the tonic of every man's life. It is our compensation for history and association. We are swept off into a vortex of activity if we do not cultivate it.

Who would be old here must strain after it. We must be green and promising, and widespread and familiar and superficial, for the benefit of the many. Everything is an average as yet, and better it should be so than stately

colleges and an antique civilization. We are sowing the continent with common schools, which is better than all the efflorescence of civilization impossible in a new land. Our education is one of life, civil, religious, industrial; that of Germany one of books alone.

We have got to find other sources of inspiration than the world has hitherto had. America is a horde of people as like as cotton cloth and about as interesting, and as long as the governing impulse and dominant atmosphere are trade it will be so. We worship mediocrity, live in a heaven of commonplace. Faculty we believe will move mountains, not faith. Smartness is our inspiration.

We have great natural feeling in this country, an unspoilt, spontaneous and youthful nature, trustful; our manners are founded on trust, the English on mistrust, convention. We have every quality of youth, its plastic nature, its buoyancy, its looking forward, its confidence, generosity and vigor. The English on the contrary are mature in every respect of analogy, egotistical where we are vain, a thinner fault; the Chinese of Europe, unchanging, insular. We are superficial, half-trained, achieve everything by an heroic audacity. We have no reverence, bear no intimidation, suffer from no infatuation, are cramped by no superstition in religion, nature or man. The English guard their rank as the Asiatics worship the Mogul. We have outgrown the superstition of rank, that sacred symbol, that social fetter and chain. We have the superstition of rich men instead. Dukes and kings are what Warwick Castle and the Tower of London are to us, picturesque antiquities. Our people crowd to see them, but they take care not to stay in England for the sake of basking in their smile. You cannot mix oil and water, democracy and aristocracy will not fuse in a common mixture or mould. We go to the continent to air our wealth.

Very's sensibility is what makes him; devout sensibility. It has never been excelled, perhaps never equalled. He is as near to God as anybody ever was. Fra Angelico is the only man with a gift of beauty who is like him. Mystics do not always have it. These two men are artists superadded. Puritanism did not admit of art. It chilled the blood. It had a sterner task. Milton struck his roots into Elizabethan soil. Thirty years later he would not have been Milton.

Very is the least indebted, the most underived. When a poet is a poet in grain, as he was, and such winnowed fine grain, we can dispense with the flourishes. One alive to the essence and atmosphere of genius feels it the moment one reads him. One noble man, Whittier, is an instance of purely literary style, diction. Very, not an atom.

His verse is gentle like the pattering of rain, purling of brooks, or chirping of robins,—voices of nature, unconscious, as pure, as sweet. A perfect inner voice in literature, not a thought of effect. His pieces write themselves, are produced through him by the spirit. He would return from this communion and write them,—unique in our literature, secondary and derivative as it is. He is phenomenal, a psychologic study. The transcendental wave which lifted, left him, and he never after came to his own.

A little literary gift is a wonder here and the writer generally has a cheap alliterative name. The country is full of small fry like white bait. We are children tickled with a straw. Talent shines provincially because we are all provincial, the whole country and nothing more so than New England, this little peninsula jutting out into the Atlantic and longing to join the mother country again and be tucked under her apron strings. Older nations know what genius is, we believe smartness is genius, as

the French do taste. The ornament is taken for the temple. Very was the temple, no ornament, its living walls.

The trouble with us as a people is that, like a novice trying his hand at an art, we think too much of the accomplishment. We strain after effect. The English have got beyond this, come through, and are fairly lodged in maturity. Good breeding has got into literature; ornament, emphasis is bad form. Repose is cultivated with knowledge and strength. Science has disciplined the world to the fact, and literature has had to drop some of its airs and vail some of its graces. We want reality having had enough of show.

Picturesqueness vanished with gothic and the middle age, but it remained for us to build a New York and Philadelphia, and call streets 74th St. and 600th St. We shall soon be called 7,000 ourselves and 9906 or a 1,000,007th. At last the American people will live in one hotel stretched from Boston to San Francisco with a bar room underneath. They will be born without legs and move in horse cars.

Coming home one hears buzzed in one's ears forever the rich man of the neighborhood. Once it was Girard and Astor, now Vanderbilt and Stewart. In Germany it was Goethe and Schiller when you went in and when you came out, now Bismark or Moltke. In England, Gladstone, Dizzy, the Queen. In France some distinguished man, statesman or literary. The Englishman lives to be somebody socially, the German to know, the American to get, the Frenchman to enjoy. Nothing will ever correct this rude addiction for a hundred years or more till the continent fills in, settles down. The time will come when it will be a vulgar thing to be rich. It is now, and America is vulgar at this hour in consequence, and mate-

rial through that. What a protest is such a nature as Very's against all this!

Everything is done to order here. Mankind are turned out themselves, million-peopled cities and soldiers' monuments out of hand. Briefness is our eternity and antiquity. We want a short cut to heaven itself. We shall breathe by machinery at last and travel by lightning, no time to think, stock-quotations will be our poetry. The future lies between three people, the Chinaman, Jew and Yankee. I think the Jew will be the last man and that his nose will be projected on Jupiter.

One day some rich man will buy out the Vatican, and the Pyramids, perhaps the Pope himself, and bring them over here, and they will be lost on the way. A woman offered to buy the *Arc de Triomphe* the other day, which if not true is *ben trovato*. We delight in bigness. Our minds are figures and might be set down in a ledger tomorrow. The countenance is commercial, shrewdness ground in, no openness, expression screwed into a cold sharpness, knit, concentrated, eyes like gimlets, a shut thin mouth, strait lips, an air like nails driven into you or files drawn over your nose, money eaten, digested and cropping out, no sensibility permitted or fraternity, still less sentiment, a living on the points of a carding machine, no craving for sympathy, self-sufficing, and yet with this terrible arraignment the best natured and most generous man in the world, too easy natured to be good. Coming from Europe we seem like dried specimens prepared for an herbarium, in summer especially, with dusters on and banged-in hats. The revulsion is painful from the easy European who enjoys life with all his cramped opportunity.

Where our scant population is, there will be another Europe with many capitals and emulation and variety of

type, taste and endeavor. Now it is all trade; what would England have been all Manchester and Liverpool? We need something to temper us. Where is it to come from? It is an embryonic country here in its oldest phase. The humanities will come hereafter. We cannot concentrate. We are always flying off at the handle. We keep green, raw-boned, unformed.

In New England we have what has never been seen in the world before, devout free thinking. The English have come to it through science, the French through scorn, the Germans through metaphysics. The Germans have deepened the thought of the world though their character is not equal to their mind, nor is their literature based on it, but has grown up in a late and sophisticated age out of a literary class. They are intellectually free though politically bound and for that very reason, having no harmoniously developed life, social, commercial, and civic, all classes mixed and coöperating, are prone to the coarsest atheism, or sanctimonious, as in the French war. The French are socially free and equal though religiously bound and now working out of despotism. The English how socially bound!—and we by trade, and in a sense both, religiously. England is a preserve of gentlemen, this the country of mankind. Our greatest production is public characters which are the most straightforward, the best the world has seen, Washington, Franklin, Lincoln, the saviour of democracy. We cannot be diplomatic in this young land. The American is transparent and has taught the world simplicity, cured it of tortuousness, artificiality and stiltedness.

For passion let me quote Wordsworth's lines on "London Bridge," the commonest sight in the world, but memorably impressive. Who but a great poet could have

given voice to the universal sentiment, stamping forever into language what had floated in men's minds from the beginning. Poets are the mouthpieces of mankind, their utterances become the common coin. Shelley has nobly set forth this in the Defence of Poetry, the function of his art to elevate mankind to pedestals from which wider and wider horizons are viewed and glimpses of the end.

Wordsworth, after describing the aspect of the mighty city at this unusual hour, works himself into a high key and is caught up into a tumult of emotion; the words burn under him:

> "Dear God! The very houses seem asleep;
> And all this mighty heart is lying still."

So at Venice a like universal pathos is given voice to in these memorable lines. Venice is at his feet, a past London, a splendid vision midway east and west in the sea, once so great, now in decay. Says the poet:

> "Men are we, and must grieve when even the shade
> Of that which once was great has pass'd away."

Wordsworth is as quotable for high emotions as Pope for sententious point. The one is the poet of the feelings the other of the understanding. Pope to Wordsworth is as varnish to oil painting. But he anticipated modern liberality and emancipation, a catholic in protestant England. He fills no need of the heart, nor does he satisfy any craving of the imagination.

Byron is memorable for passion. In one outburst he writes lines worthy to be inscribed over modern times for comprehensiveness and felicity, having every characteristic of the most consummate art without the consciousness of it, so different from and so superior to Tennyson;

showing too how rhetoric may be married to verse when the man is great enough:

"Come, and compare
Column or idol-dwellings, Goth or Greek,
With Nature's realms of worship, earth or air,
Nor fix on fond abodes to circumscribe thy pray'r."

And again:

"And not a breath crept through the rosy air,
And yet the forest leaves seemed stirred with prayer."

Shelley with his pale fire leads the way like a disembodied soul as he is fleeing through space, fleeting through verse as the wind sighs through Eolian harps, or wanders over the sea engraving it with an emotion like its own, as tremulous, as vast; susceptible like a spirit, possessed with divine fire and frenzy of love; most sensitive, above all writers gifted with sympathetic versification, which is his own; the organ of modern times, its one note of sensibility; meeting nature in her fastnesses, and exploring the human intellect through and through, haunting it. The "Hymn to Intellectual Beauty," Nature has woven it about herself as the worm buries itself in its own cocoon till it is lost from sight. The elements themselves write for Shelley; and every emotion lends its aid, and flying impulse, and craving momentary vein. He is subtle and natural.

No poet has such lyrical fire in our tongue, soul all aflame; he takes hold of us vitally. All young men now in this emancipated era, growing on to meet Shelley, worship him. Who combines intellectuality and sensibility like him, voice as he is of progress, poet forever of enchanting melancholy, poetic tender melancholy, sadness which is holy,—the old poets touch it demurely, coquettishly,—with ravishing grace, delicacy, penetration? Honor to the English race! showing how wide they are,

the race of common sense, the successful race of mankind, from whom you would as soon expect poetry *a priori*, as you would a flower from the cactus, thorny shrub.

He was so near to Nature, he screamed in her ear; she heard him and gave him her pass key, as so many orthodox people think they have it to heaven, they are so intimate with the Almighty; yet so dull is our New England, with all its goodness and propriety, in this respect of sensibility, grace and harmony, he has been called no poet. Of course not to those who have no passion and what comes from it, the burning marl of verse and white heat of inspiration. Arnold, who is an intellectual poet, speaks in like terms of Shelley, who distances them all by his ignis fatuus light which they in vain attempt to follow. Shelley's intensity and passion are illustrated, *passim*:—"Julian and Maddalo," "Epipsychidion," "The Zucca," "Time," "Mazenghi," "Adonais," "Constantia," "Prometheus Unbound,"—especially the passage in Palgrave's "Golden Treasury" entitled, "Hymn to the Spirit of Nature."

In Tennyson, the embroidery covers the design and sticks out. It is stiff with ornament. He fingers the instrument too much, jews-harp poetry, tickling the ear, a dancing master posing for Apollo: dainty at all hazards, cloying, effeminate, tricks, all resources of poetic effect exhausted. It is all plum pudding, "slick and slab," smooth, a besetting verbalness, refrains, alliterations, every artifice, thought and feeling overlaid with clothes and finery of style, a stifling artificiality in which we breathe with difficulty and sigh for fresh air, hothouse style, not a natural note, never a masculine simplicity. The art comes before the matter. In the great realms of English verse, a dandy. What the old conceitists were,

mannered. The style never grows clear. With the finest touches possible, the richest expression and freshest, an intimacy with Nature almost his own, she never gave *him* her pass key. He is always a pretty boy playing with her ringlets, never a full grown man. Such exquisite things as he has done, such jewelry of literature, such honest sentiment, such extensive knowledge, such wide sympathy, such mouthpiece and mirror of the times, never its leader, such snatches and rhymes, such verbal felicity, such graces like a girl, such searching and reach of sentiment, delicacy, color, such an iridescent fancy, feeling for his art, such a figure coming on the top of all time in poetry and knitting its yarn and web and holding the skein to the light, all marred by lack of manliness in style—*le style c'est l'homme*—of fibre, largeness, passion and breadth:—a flute-like note, not a trumpet tone, never a transparency to the God within and never a pure mirror to the universe without. The note was lost with the last great generation, the instrument broken, the edifice cast down, and we are gleaning the ruins, or developing the dispensation and have not exhausted its teaching. Nature will not give us another revelation just now. She is waiting for us to assimilate the last.

The "In Memoriam" is overwrought, no spontaneity, making capital out of its grief, preaching about it, and curiously probing it, mosaic, Cellini work compared to true sculpture, embroidery to painting, no perspective, freshness, subordinating workmanship to growth, process to organism, ingenious, ornate. The "Idylls of the King" are strained, artificial in atmosphere. Byron is a god through large and lifting passion, so are Keats, Shelley, Wordsworth in inspiration if not in form,—all were healthful then; Scott, Coleridge, Campbell, Moore, each in his kind, all divinities and possessed. They were rounded

men. It was a great era and formative. They were pure in art, what the great masters were to later men; Titian, Angelo, Raphael, to the derivative artists who succeeded them. Since the beginning of the century all is aftermath. Genius then leaped from its scabbard, nature was laid bare, a volcanic flame shot from the central heart.

Gray with his Elegy captivated us and with his Bard spoiled us. He was a model. He brought the old world and every tender and poetic association to our door in a rough and colorless time. The inspiration of the Elegy and what makes it memorable in English literature and in all literature are the hour and the scene. Like old Italian painting, Perugino or Lo Spagna, it sanctifies the time. He has made the subject his own and written of it as no other poet has done, with a wealth of sentiment and a beauty of illustration that redeem the last century, barren as it was in sensibility. The Elegy would make it memorable if nothing else were left. Especially does it affect the English race who love nature and are near to her, and our people who must borrow their sentiment for we have created none of our own.

Burke did for the prose what Gray did for the poetry, gave the perfected model, but Dr. Johnson's sesquipedalians took us more. He became the parent of the prolific American rhetoric. Gray came near to us through association with the sweetest rural things, the twilight hour, the old world, which we never saw but read of in books, from the primer to the bible. Johnson with his didacticism struck a responsive chord, and shaped American taste.

Gray has one burst, the only one I know in him. He is the hinge, the pivot, the half-way house, the sign-post between old and new. Deriving through Pope, Dryden,

Cowley, profiting by their ordering of the language, he finished it in verse as Burke did in prose. With him the door was closed for half a century. Burke did not take us. We did not have genius. Gray says:

> "The meanest floweret of the vale
> The simplest note that swells the gale,
> The common sun, the air, the skies,
> To him are opening Paradise."

This ought to apply to every day, and in a rightly constituted mind it does. Nature to a lover is never indifferent, the darkest day or roughest or most slovenly that ever was. One loves one's existence every day of one's life and nature is a part of it. The language has scarcely had a new note since, but has gone on, on the lines he traced. It came to its maturity then, its majority, and a language cannot have two lives. Much more passion and sensibility have been wrought into verse, the changes rung. Gray was cold, formal, limited, cramped by his century; but a classic, a completion, an era, a departure. Shelley prolonged the note, Byron sounded bugle notes, trumpet tones. Coleridge wove subtle harmonies, the finest ear since Milton. Tennyson, Browning, Swinbourne, have wrung something out by screwing, pinching, squeezing and stretching the language; twisting and turning it inside out and upside down. Shelley's was a matchless lyrical fire, kindled on the altar of a soul aflame. Byron is his own "exulting and abounding river." Ruskin has domesticated the coloring of poetry in prose, but he is full of a calculated literary emotion. Carlyle has fired the tongue with epic prose, picturesque intensity. It thinks too much of itself, not of its subject, for a great style. Men came down from their pedestals after the opening generation of the century and were too conscious to be great.

Poets describe themselves in their verse. Milton "builds the lofty rhyme," Wordsworth has "the accomplishment of verse," Byron is "the exulting and abounding river," Shelley pours his verse "in profuse strains of unpremeditated art," "like light dissolved in star showers thrown," and his poetry

> "Round western isles with incense blossoms bright,
> Lingering, suspends the soul in its voluptuous flight."

Shelley has passages of passion in the poems referred to, very memorable in English verse, bringing in more sensitively the soul, the whole being, than any other writer, so that the lines tremble with their own emotion, and the whole ocean sags in the style and ebbs and flows and edges irresistibly, or sweeps with its incommunicable wave; and the verse is as the sands and the snow, moulded by the winds and waves, moulded and wrought. The breeze quivers in the lines. The whole scene is mirrored in his powerful style and penetrating feeling. Language vibrates under his touch as reeds quiver in the wind, or the waves beat the sea. The dense sweep of the verse and liquid note are as if Nature's own hand were on the strings. It is one with nature, she is poured into it as into a mould. This is sympathetic versification and it is greater than imitative harmony. It paints the picture broadly in the feeling not in the eye, subjective, emotional, and who would not have such an eye to see with? He opens a window in the soul from which the world is as created anew.

Emerson's poetry is bare of sentiment, romance, association; too mainly intellectual. There is no "lyrical cry," no sense of continuity and music in it, the careless running line where versification trips off with the soul upon its back, free as the winds,—too serious. Perfect as the Humble Bee is in sympathetic drone and buzz,

and finely imitative as the Snow Storm, a sustained note of style, the form is mostly old English, Marvel and Herrick, and others of the time of surprises and the golden ore of poetry. Emerson has no song in him, no feeling in proportion to thought and acute perceptions. Feeling is the mortar of poetry without which its edifice does not rise. It is the string on which its beads, for religion or beauty, are strung. It is Milton's "passion."

Shelley is the deepest-breathed of modern poets. He empties his nature into his verse. He lends you his soul to see with. His matter is not rich, but his manner and scope are unlimited.

Emerson is a string of brilliances not fused. Too tense, too much strain. We miss the connecting link, the subtle alchemy of emotion, grace, unconsciousness. Coruscation, astonishment suffice not. We wish to be appealed to in the heart, converted not amazed. We are let up into high regions and pure, too rare for verse. Speculation is not poetry.

Emerson is the pithiest writer that ever lived. His works are strewn with thoughts like blackberries. This is the old English way of Bacon and others. He is a graft taken out of England two centuries and a half ago with New England relish added, the best Englishman living because countryman at this hour of Andrew Marvel, Milton, and the like. But he is too intellectual for poetry. New England generally is, and too moral. Everything is crushed into apothegm, pithy, condensed, neat, felicitous. This is not the manner of inspiration, or of a very dry kind; poetry is primarily feeling; all art is, as religion itself. Homer, the father of poetry, is not great for thought, nor Burns. Great art is in simple lines of infinite complexity like nature herself.

Swinbourne has been adding a swing, a verbal note.

Poe was a mechanic, nothing more in poetry, tintinnabulation, and showed our quality which is ingenuity, invention, not imagination. Poe was what Copley was in painting. Walt Whitman seems to have the ore unsmelted, to be a symptom not a fulfilment. He has the largest criticism we have had here it seems. Browning is as rugged as Tennyson is sweet. Foils to each other, they fly apart into extremes. They shine by opposites. Browning is a Velasquez, by all means masculine; Tennyson, Murillo. Both Browning and Emerson, avoiding commonplace, run to the farthest limit of obscurity and terseness.

We are insisting upon literary form while treating of one who was innocent of its attractions, who drew his inspiration from beneath, behind, above and beyond literature, from the spirit itself, far away in the soul where no ambition comes, but only lowliness, humility and seeking.

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The following letters were then read by Rev. Geo. H. Hosmer.

JAMAICA PLAIN, MASS., DEC. 10, 1880.

MY DEAR SIR:

I have delayed answering you in hope that I might be able to come to your meeting, but I find it will not be in my power to do so.

I have had a great respect for Mr. Very: first, for his profound and sincere religious convictions, secondly, for his genuine vein of poetry. So much of our religion is more or less outward,—a religion of outward conventions, outward rituals, outward beliefs, outward profession and experience,—that it is an immense help sometimes to meet with a man to whom religion is a central life, which would be the same if there should be no other religious man in the world beside himself. And such was the religion of Jones Very.

His poetry was equally genuine,—original in this best sense, that it originated in his own soul, and was not borrowed nor copied. It was very unequal, as all natural products are apt to be; but I think there are

a few of his poems that will last with those of George Herbert and Henry Vaughan. His poetic vein was a slender rill, but pure, clear, coming from a deep source, and like that of Siloa that flowed

"Fast by the oracle of God."

Very sincerely yours,
JAMES FREEMAN CLARKE.

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BOSTON, 71 CHESTER SQ., DEC. 13, 1880.

DEAR SIR:

With sincere thanks to the Essex Institute for their kind invitation to be present at the Memorial Meeting in honor of Jones Very, while I regret that it will be out of my power to be with you on this interesting occasion, I heartily rejoice that you are to pay this merited tribute to a man of such true excellence and exalted genius.

Modest as he was, and shrinking from observation, there might naturally have been many who did not fully appreciate his real worth.

We find that such men as Emerson, Bryant and Dana, recognized him as a truly gifted man of genius, one set apart by Heaven and endowed with the faculty divine, whose soul was kindled with celestial fire, and whose words would have immortality. With each year this conviction has been extended through wider and wider circles. The beauty, the sweetness, the depth of what he has written have been more universally felt.

There was nothing about him meretricious. His words come from the very heart of Nature, breathing her harmonies and partaking of her inmost spirit.

I knew Very intimately during his college life, and while he was at the Divinity School in Cambridge. He was ever one, who, in the language of Milton, "beheld the bright countenance of truth, in the quiet and still air of delightful studies." He was a thorough classical scholar, an able and acceptable teacher, a profound lover of Milton and Shakespeare, a man of individual research and thought, a man of simple manners, pure and delicate tastes, and of noble character.

His fondness for Nature was intense. The stars above and the flowers below were an unfailing delight. They were a sacred companionship; while

"With an eye made quiet by the power
"Of harmony, and the deep power of joy,
"*He saw into the life of things.*"

He so reverenced and loved Nature, that he seemed to become one with her. Her will became his will, and his utterance was her voice.

I knew Jones Very while he wrote the sonnets which have since awakened wide attention. He often came to my room and conversed with me, and I have now a number of these remarkable productions in his handwriting, as they were written. His mind was like a harp string from which the passing wind brings melody. He associated the Divine Mind with all the marvels and mysteries and laws of Nature. So that when her loveliness, her harmonies touched and inspired him, to him it was the breath of Heaven and the inspiration of God. His belief was with Emerson.

"As there is no screen or ceiling between our heads and the infinite heavens, so is there no bar or wall in the soul where man, the effect, ceases, and God, the cause, begins. The walls are taken away. We lie open on one side to the deeps of spiritual nature, to all the attributes of God."

He accepted the great truth of the Scripture in respect to the Divine Mind, that "in Him we move and live, and have our being."

He held with Channing, that "the man of genius, if a devout man, thanks God for the influxes of mental illumination, as peculiar communications of His intellectual energy, and prays that he may be more and more open for the reception of these heavenly gifts."

Jones Very, when I best knew him, lived habitually on a high level of spiritual life. He had entered what Bunyan describes as the country of Beulah whose air is very sweet and pleasant.

He seemed to dwell within sight of the Celestial City, on the very borders of Heaven, in that land where the shining ones commonly walk. Can we wonder that he felt that God was with him?

With this feeling Jones Very wrote. With devout mind he communed with the Infinite One, and from the Supreme Intelligence he felt that there came to him an influx of a higher thought and life.

His faith was the faith of Milton, who declares that he sought what he should write "*by devout prayer to that Eternal Spirit, who can enrich with all utterance and knowledge, and send out his seraphim with the hallowed fire of his altar, to touch and purify the lips of whom he pleases.*"

But I fear I may be saying too much, though I know you will only make use of that which you feel to be best adapted to your purpose.

Knowing that you have able minds to add interest and value to this occasion, I feel sure that you will make it memorable.

With the highest regard,

Very truly yours,

R. C. WATERSTON.

MEMBERS OF THE ESSEX INSTITUTE, FRIENDS AND FELLOW-TOWNSMEN:

I am very sorry that I cannot be with you in person; if I had been, I should have tried to say to you what I am now saying from this paper.

I can only hope that this expression of my feeling of love, gratitude and veneration, even though I contribute nothing new towards a proper and full estimate of the man, his life, his spirit and his writings, will in some way help to make more vivid the general reflection of his peculiar personality. even as every, the least, drop of the dew or of the ocean goes to intensify the glow of the sun's imaged light.

Of Jones Very's boyhood and school-days I have no special reminiscences. I recall only his quiet and dignified demeanor, his slender figure, a kind of emblem of uprightness, his sweet smile, and in general the respect and esteem with which he inspired his companions. I remember how he looked far better than what he said. During my college life, I began to see the initials J. V. affixed to pieces of poetry in our Salem papers, such as the lines to my old favorite "The Columbine," and particularly was I impressed with his majestic hymn at the dedication of our new stone church on Essex street. Meanwhile those wonderful sonnets of his had begun to make their appearance, than which it seemed to me and does still, that nothing finer in that department (or at least in this special portion of it) had been done by any writer in our language, and which seemed to me to place Very as a sonneteer up by the side of Wordsworth, Keats, Blanco White, Elizabeth Browning, and Shakespeare.

About this time (I am now speaking of the very last part of my Cambridge life when I was a Divinity student, and Very was an undergraduate), I used to hear of the peculiar friendship Professor Channing had for him, and of the long and earnest discussions they had about Shakespeare, and particularly Hamlet, as darkly revealing Shakespeare's personality, which Jones was then trying so hard to express, and of which he has embodied his idea in one of the essays of the little volume of prose and verse that came out under the supervision of some admiring friends in 1839.

After this time, having taken up my abode as preacher in another state, I used to meet Very only rarely, not always once in a year, when I visited my native place, but when I met him, the first thing that impressed me was always that peculiar sweet smile which I remembered of old. Now and then I enjoyed a walk with him, which, by his leading, would always be to the pastures. Of his conversation at such times, what I remember the most prominently, is the way in which he would stop, after expressing some thought about nature, man or God, that he seemed to fear might appear commonplace from

its simplicity, and then turning round and fixing upon you an earnest look, as if he would show by his piercing glance that there was a depth in his thought concealed from superficial minds by its very transparency. There was something in his manner at such times that I find quite indescribable, but it was very impressive. If I should walk these fields to-day (as I often do in spirit), I should always feel that he was walking by my side, and testing unconsciously my sense of the depth of meaning hidden under our familiar phrases, by his extraordinary manner of pressing homely truths upon the attention.

Speaking of these walks in the pastures, leads me, by a natural transition which will presently appear, to say a word of our friend as a preacher. I think I never heard him but once, and that it was, if I remember rightly, at the East Church. As I recall his face and manner in the pulpit and the drift of his discourse, I am strongly reminded of the look and natural religion of Greenwood; and the beautiful photograph of Very which lies before me, so singularly expressive of saintly simplicity and unselfish translucency to the soul of goodness, brings Greenwood still more strikingly to my remembrance. And I recall the description given of his ideal preacher in the "Task" beginning, "I would describe him simple, grave, sincere."

But the fact I was going simply to recall was, that among all the numerous sermons I have heard from my boyhood in Salem, that was the only one in which I ever heard any reference to the beauty and glory of our old town pastures, upon which Jones dwelt with great enthusiasm.

As preacher, however, I suppose he never would have brought himself by his manner sufficiently *en rapport* with the mass of hearers.

Not that he was wanting in geniality. He had a fondness at once for flowers — those children of Nature — and for children — those flowers of Humanity.

And in closing this imperfect paper, I may apply to our beloved friend, as true in the spirit with regard to him, the beautiful lines of the German poet Uhland, on the "*Death of a Country Pastor*."

> "If to departed spirits Heaven e'er grants
> Leave to revisit these their earthly haunts,
> Not in the moony night wilt thou return,
> When only sorrow wakes to weep and yearn;
> No! when a summer morning greets the view,
> When not a cloud-speck stains the expanse of blue,
> When high the golden harvest rears its head,
> All intertwined with flowers of blue and red,—
> Then wilt thou through the fields walk as erewhile,
> And greet the reapers with a pleasant smile."

CHARLES T. BROOKS.

NEWPORT, DEC. 11, 1880.

BOSTON, 25 BRIMMER ST., DEC. 14, 1880.

MY DEAR SIR:

I reluctantly find myself unable to attend the meeting of the Essex Institute this evening, which is to be devoted to a commemoration of Jones Very. There would have been a special pleasure in sharing in the tribute of respect and honor which all of us his fellow-townspeople owe to the memory of one who has signally illustrated the honorable name of old Salem by his pure fame, and whose character is so perfectly mirrored in his exquisite verse. My own earliest recollections of Mr. Very go back to the years closely following the publication of that early volume of "Poems and Essays" which still stands alone among the choice flowers of American genius; and the poet then seemed, as he always continued, to be one from another world, a pure spirit, veiled from intimate human converse by his intent communion with higher thoughts, yet descending therefrom to put aside the veil of shy reserve for some word or look, which revealed the inner nature of the man himself. There was always the same courtesy of a soul rarely gentle and refined, whether as I first remember him, he was showing some kindness to a child, or in later years in his greeting of a younger brother in the profession which he dearly loved; and one always felt that in seeing him we entertained an angel, hardly unawares.

His fame as a poet is secure; the highest point of spiritual feeling and expression has been reached in his most perfect poems; and he will not be forgotten among those singers of Christian mysticism, who form a class apart and go down through the generations with singing-robes of white and with the light of Divine Contemplation in their eyes.

Such a genius as his and that of Hawthorne would seem to show that out of the Puritan ancestry and the conditions of our old town, the rarest and most delicate blooms of sentiment and spiritual life may spring. I have sometimes thought in meeting Mr. Very in search of the earliest flowers of our rocky pastures, that his own spirit and writings might fitly be compared to the blossoms he was seeking, springing up like the columbine or the houstonia, which nestle close to our gray ledges, with an ethereal beauty more vivid by contrast, and seeming as much akin to the serene sky which bends over them as they do to the earth out of which they spring.

I should have been particularly interested in listening to Mr. Andrews' study of Mr. Very's genius, and am confident that that and the whole commemoration will worthily manifest the true and deep feeling in which the man and his poetry are enshrined, in all who know them. What President Walker said of another rarely refined

and sensitive spirit may be applied to Mr. Very and to what he wrote: "He was as pure as a mountain spring."

With regard,

Very truly yours,

HENRY W. FOOTE.

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MILTON, MASS., DEC. 13, 1880.

MY DEAR SIR:

I thank you for letting me know about the Jones Very Memorial Meeting to-morrow. No fear but he will live, whether we talk about him or not.

Every spring will bring its fresh memorials, as the robin comes back to whistle the note so dear to his ear, and the columbine still holds the words of blessing which he dropped into its radiant cup.

How can we doubt that some of his sonnets will be more valued two hundred years hence, than they are to-day?

Nor will the traditions of his visible presence among you soon vanish. Amid all the competitions and strifes, the vain tossings and envyings which were vexing the multitude around him, he calmly walked on from year to year, like an impersonation of "the still, small voice."

It is easy to believe that he has now found a sphere more delicately attuned to his sensitive, loving, and devout nature. Even in this world, his conscientiousness and his vivid sympathies sometimes overmastered his inherent reserve.

Forty-four years ago, as our Greek tutor in Cambridge, this shy student was the ideal instructor. When others were entrenching themselves behind the dignities of their office, or, trying to forget in their comfortable homes, the irksome routine of their work, this man was singling out among the freshmen those with whom he might take long walks, whom he could visit at their rooms, and who would call upon him. The class was so small that it was not hard for him, gradually, to get acquainted with us all.

He was none the less a Grecian, for being a child-like Christian. In the spirit of his Divine Master, he gave himself to his pupils.

The best evidence that what he said and did was not in vain is the hearty, loving testimony which our surviving classmates, forty years later, as they met together in the hilarity of a class supper, rendered to his memory. He came in among us then, invisibly, and, like the gentle breathings of an Æolian harp, his pleadings in behalf of purity and uprightness seemed to make themselves heard again, as one after another attested his individual sense of obligation to Jones Very.

Had you been there to listen you would have said: What benefactor can compare with him, who touches the springs of character?

What new avenues of service for a spirit like his must now be opening!

But I forbear longer to encroach upon your time, although the theme is so beguiling, and remain,

My dear sir,
Most truly yours,
WILL. ORNE WHITE.

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TRENTON, NEW YORK, DEC. 13, 1880.

MY DEAR SIR:

I read in the Christian Register of last week, that it is proposed to hold a meeting of the Essex Institute to-morrow evening, to commemorate the life and literary services of Jones Very. Though I have no claim to be ranked among the "distinguished gentlemen," who are expected to be presented by letter or in person, I cannot refrain from coming, even uninvited, to lay my slight tribute, by letter, at the disposal of those who have charge of this meeting. Different voices, if sincere, may add something to the interest of the occasion.

I esteem it a very great privilege to have known such a man as Jones Very. I am proud of being his townsman; and it is one of my great regrets that I did not know him more. And yet perhaps I should rather say, that I regret not to have *seen* him more — not to have been oftener in his spiritual atmosphere. For he was to me a perpetual lesson of *unworldliness*, and this world seemed to exist for him only as the prelude and interpreter of a better world. He was continually (though all unconsciously) preaching to me, how little one really needs of those things which are summed up in the phrase "modern civilization." In the anchoret's cell — still more, in the lonely forest or seaside, — he would have found enough to feed his spirit. He was truly the "voice of one crying in the wilderness." The very opposite of the nineteenth century, he was here to show that man does not live by bread alone. A special lover of *sonnets* as I am, Milton's and Wordsworth's alone can in my judgment be put in the same rank with his; and even theirs do not lift me into so high a sphere as his. He writes to me, like one who never borrowed, or needed to borrow; but who "spake as the spirit gave him utterance." I pretend to no power of literary criticism — I can only say what he was, and is, to me. Another evidence has been given us of the life which is Eternal. He must be strangely made, who can think of such a personality as having become extinct, because invisible. To doubt immortality in his case would be justified only by Atheism. But I try in vain to satisfy myself with any estimate of his literary or spiritual excellence.

He is beyond my measurement. I can only say I loved him, and honored him, and esteem it one of the bright anticipations of the coming Life, that I shall meet him again.

Very truly yours,

WM. SILSBEE.

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CHRIST CHURCH RECTORY,
RIVERDALE, NEW YORK CITY, DEC. 9, 1880.

MY DEAR SIR:

The papers from Salem inform me, that a Meeting of the Essex Institute is to be held on Tuesday evening next, commemorative of the life and the service to literature of your late townsman, the Rev. Jones Very.

I wish that upon an occasion, alike honoring the memory of that gentle yet strong soul and the Institute itself, I could be with you. To have known Jones Very, as I knew him, not alone while a resident of the old City by the Sea, but long years before, I count a benediction.

Your notice of the meeting, in its terms, furnishes a text,— not for a sermon,— but for more than either my opportunity or my ability would dictate in the way of loving remembrance, no less than of real appreciation "of the life" of Jones Very and "of his service to literature." The terms of the notice are most happy. In *his* instance there was *a life*. They who knew him best, knew also, *what* and *how good* it was. There was also "*a service*." Some of Jones Very's sonnets are worthy of a place in the highest classification of that form of poetry. I do not say that he should have lived away from Salem. I think he loved old "Naumkeag" with a child's love; but had he been transplanted, I am not sure that the "Lake Country" of Wordsworth and Southey might not have been as fitting a home and framework for his musings and "poetic outcome," as for the bards who have immortalized the region and themselves.

I can never forget Jones Very. I have walked with him and talked with him; been instructed by his word and realized in his gentleness, purity, and yet manly strength, much that is most exemplary and might well be coveted, without violence to the commandments. His lines, on one of the Psalms, paraphrasing the words "When will Thou come to me," are worthy of any poet.

Believe me in great haste,

Sincerely yours,

GEO. D. WILDES.

Also letters were received from Ralph W. Emerson, Andrew P. Peabody, D. D., Edwin M. Stone, and Col. T. W. Higginson, expressing their interest in the subject of the meeting, and the high estimation in which the writers held Mr. Very, both as a man and a poet of unusual excellence.

MONDAY, JANUARY 3, 1881.

A social gathering of the members and their families was held this evening. The rooms were opened at 7.30 P. M. Various illustrated volumes from the art and the centennial departments were placed on tables in different parts of the hall for examination. Dr. George A. Perkins, in one of the alcoves, had his microscope, and exhibited many fine and well-prepared specimens. Appropriate remarks were made by Prof. E. S. Morse, Vice President D. B. Hagar, and Rev. De Witt S. Clark of the Tabernacle Church, interspersed with vocal music under the direction of Mr. John C. Chadwick; the persons taking part were Miss E. Buffington Kehew (soprano), Mrs. C. R. Washburn (contralto), Messrs. Murdock Macpherson (tenor), Fred M. Cate (baritone), John C. Chadwick (bass), and Mr. Charles A. Clark (pianist). The music was good and very enjoyable. After a simple repast at 9 P. M., and an hour spent in social conversation, the company gradually withdrew.

TUESDAY, JANUARY 11, 1881.

A winter field meeting was held this day at Chebacco Ponds. A new departure was made by this meeting, the first probably of the kind in this country.

The day was all that could be desired, the weather mild, the sleighing excellent. The party left Plummer Hall, Salem, in two large boat sleighs driven by veteran whips. A genuine old fashioned New England sleigh ride was enjoyed, and on entering the woods in Essex, there were some fine touches of winter landscape. Shortly after midday the party arrived at the Chebacco House, the place of meeting. The botanists rambled about the borders of the ponds (which were thickly frozen), and collected specimens of various woody plants and branches of trees and shrubs, showing buds, shoots, etc., for examination at the afternoon session which was held in the large hall, soon after partaking of an excellent dinner which was served at one o'clock.

Vice President F. W. Putnam, in the absence of the President, called the meeting to order with a few remarks on the general character of winter life and the great interest that its study has for those who investigate the many ways in which life, during our cold winter, in its many forms, is protected and continued. He gave a few illustrations from the lower animals, particularly of the humble bees. He then stated that a field meeting in winter was a novel thing, and he believed this was the first one that has been held in this country; and as the Essex Institute was ever in the advance in all such movements, he was glad that the conception of such a meeting, by the members of the Institute, had resulted in this gathering. Without detaining the members with further general remarks, he said, he should now call on Prof. E. S. Morse to address the meeting on such subjects as the occasion suggested.

Prof. Morse first alluded to the method of protection

of the eggs of the cankerworm and other insects in winter; and then taking the snow and ice as his special subject, he gave an account of the formation of glaciers, the moraines and glacial currents, and the great results of the glacial action on the surface of New England. The movements of the glaciers were accurately described, trending from north to south, as showing the immense distances over which bodies taken up in the glacial drift are carried.

In closing, Prof. Morse alluded to the existence of man during the glacial period, and the important discovery made by Dr. C. C. Abbott of Trenton, N. J., of stone implements in the gravel at Trenton.

In response to the call of the chairman, Dr. C. C. Abbott, who was present by invitation, gave a brief notice of the discovery of the chipped-stone implements in the gravel, and the condition under which they were found.

He said this was his first field meeting, and it was evident that a winter field meeting could be carried on as successfully as a summer one, and he was very glad to be present.

The chairman alluded to the very recent discovery at Wakefield, Mass., of chipped-stone implements of the same character as those found in the Trenton gravel, and of the great probability of their discovery, in place in the gravel, and called upon the members of the Institute to look with care at every cut through a gravel hill, with the anticipation of making the important discovery of a palæolithic implement.

He then called upon Mr. John Robinson of Salem, the botanist of the Institute.

Mr. John Robinson exhibited a number of twigs of trees of various kinds, showing the condition of the buds during winter. After a few special remarks on the specimens collected during the morning, he read the following paper on

## OUR TREES IN WINTER.

The winter condition of our deciduous trees is for them a matter of necessity. They are bare and rigid at this season of the year from force of circumstances, and not because it would be impossible for them to be otherwise, were they placed under different influences.

There was a period, previous to the last glacial epoch, in the geologic history of our earth, when what is now the perpetually frozen north was covered by a luxuriant vegetation, and the present temperate region of North America, including our own New England, possessed a sub-tropical flora. Then the winter was not the cold, snowy season we are all familiar with, but there was at most, only a season of rest for the trees and herbs which covered this portion of the earth.

Countless ages of time changed that old geological climate, by slowly freezing out, at the north, the forest of the former period. As the cold wave continued its course southward, the plants of the northern region were forced before it, far beyond the limits of the present temperate flora, but they were permitted to return as the cold wave receded, and to re-occupy the positions in which we find them about us to-day. It would be impossible that, throughout all these great changes, any plant could be so constructed as to conform itself to them without becoming greatly changed in character itself.

Plants are in this respect unlike animals; they cannot move out of the way of unfavorable influences; hence,

they must vary, and individually adapt themselves to the changes of climate and surroundings, or perish.

For numberless generations, plants have been slowly adapting themselves to their appropriate places. Natural selection and the survival of the fittest forms, for the positions they are to occupy, have placed on the earth's surface, the exact species in the exact positions best suited for their development. In different climates and in different situations, the particular variety too, of the species that can best sustain the local conditions to which it must be subjected, is found.

This is illustrated very clearly by some of our own forest trees. One of the most widely distributed of North American Coniferæ, and one little changed in appearance, is the Red Cedar. This tree is found as far north as latitude 50°, and south to the Gulf of Mexico. It extends also from the Atlantic to the Pacific in some portions of our continent. At its northern limit it is only a shrub; on our own sterile hills, it becomes a rugged tree and is of no little economic value for many purposes; while in the warmer climate of Florida, the same species is confined to the swamps, and from it is obtained the clear, soft wood, used the world over in the manufacture of the best lead pencils.

Many of the trees, familiar in our woods, become towards the Arctic circle mere shrubs, as, for example, the Birches, the June-berry, and the Spruce. Others of our native flora, which here in New England are but shrubs, under more favorable influences in a warmer climate, become forest trees. Among such are the Chinquapin Oak and the Magnolia.

Among the trees having naturally a rather extended distribution, and one of recent introduction into New England, is the Douglas Spruce. This tree is a native of

western North America. It is common from British Columbia to Mexico, extending east into the Rocky mountains of Colorado, whence it has been introduced here.

Each of these trees and shrubs, of which we have been speaking, is known to be of the same species over the whole area of its distribution, even in widely different climates. Yet, gradually, in each and every climate, a different constitution has been developed in the particular individuals of each species which are there found. This has been proved by practical experiments.

Children inherit the characteristics of their parents, and even the seeds of trees carry with them and perpetuate the constitutions, delicate or strong, that the region, in which they were produced, developed in the parent plants.

The climate of the Pacific states is wholly unlike that of New England, being, on account of the influence of the "black current" of the Pacific ocean, more like that of western Europe. The climate of the Colorado region, in which the Douglas Spruce grows, is not essentially different from our own eastern climate. The seeds of the Douglas Spruce, from this Rocky mountain region, produce trees which are as hardy here in New England, as the Cedars on our hillsides; while plants raised from the seeds of the same tree, growing in the milder, moister climate of the Pacific states, fail entirely to adapt themselves to our New England climate, as do all the trees with hardly an exception, from the region west of the Rocky mountains.[1]

The temperature of the New England states is so variable, and the extremes of midsummer and midwinter are of such wide range, that plants must make some special

[1] This has been previously presented in a paper by the writer, read at the meeting of the Mass. State Board of Agriculture, held in Southboro, Dec., 1880.

provision for these changes. This they do in several ways. The herbaceous plants retire below the surface of the ground, and maintain life in their roots which are filled with nutriment ready for a rapid growth in spring; or, they store up a similar starchy material in bulbs or in tubers. These three classes of herbaceous plants are represented respectively by the Golden Rods, the Lilies, and the Ground Nut.

In summer too, our ponds are in many cases partly filled with a floating or half submerged vegetation. In winter they are bare on the surface, and the water is clear often to a great depth; all the vegetation having sunk to the bottom, there to contribute to the rich ooze which forms the floor of most of our ponds for the protection of the thick roots, winter buds and seeds, which are rapidly to fill the ponds with vegetation as the next summer advances. All these plants are protected from sudden changes of temperature by being below the surface of the earth, and they are often farther provided with a mantle of snow.

The woody plants, however, cannot avail themselves of this privilege. They cannot retire beneath the surface to reappear in spring. They must find other ways to withstand the cold. They must hibernate within their own coverings.

As this present flora was slowly distributed and crept from point to point as the ice receded, in the last great geological change, only such trees could maintain a foothold, as were well provided against extremes of temperature. By the continual weeding out of weaker individuals, and the strengthening of stronger, we have left to-day the grand result of this work of nature through the countless years that these plants have been adapting themselves to our particular climate.

In protecting themselves against the cold of winter, all trees have not followed blindly the same rule; they have not imitated a leader in fashionable winter clothing, but each species for itself has quietly gone to work to select the best method at hand to provide itself against the cold, and has increased or decreased such protection as circumstances required.

We have trees capable of shedding their foliage at the approach of winter, as do the Maples and Ashes. We have trees capable of retaining their foliage for several years, as do the Pines and Spruces. We have trees producing flower buds in the fall, ready to open at the first trace of warm spring sunshine, before leaf action is required to perfect them, as the Birches and Alders. We have trees producing flowers so late, that the leaf action is absolutely necessary to develop these flowers, as the Catalpa and Tulip tree. We have trees which, during the autumn, protect the next year's half-formed leaves by surrounding them with thick scales, as in the Hickory; and often still more securely, by covering over the outer scales with a coat of varnish, as in the Horse Chestnut. In contrast to these, are trees whose winter buds are bare, the outer leaves or bracts being unprotected by any covering, as in the Garden Lilac. This is very noticeable in the flower buds of *Cornus florida*, where the showy white of the so-called flower is formed by the rapidly growing bud scales, which all winter have been fully exposed to the cold, while protecting the true flower buds which they enclosed. These latter forms of buds are so largely filled with solid matter, and so devoid of water, that they are incapable of being injured by cold while in the winter state.

How often, during the winter we hear the question asked,— Does the sap in plants freeze? This subject has been before the public for a long time, but it is chiefly

discussed from the horticultural rather than from a strictly scientific point of view. It is a subject which even the most eminent botanist finds difficult to explain in a simple and satisfactory manner.

We often hear the woodman settle this question of freezing or not freezing, by asserting that when the trees are cut in winter the chips fly off frozen solid. A writer in a horticultural journal, not long since, sought to prove that the sap in trees became frozen in winter, by stating that the Lime trees on Boston Common froze until the trunk cracked open sufficiently to permit the insertion of his hand to a considerable depth into the trunks of several of these trees. This habit of opening upon the side of the trunk, during extremely cold weather, is common among Lime trees and some other species. Neither of these illustrations, however, proves that the sap freezes.

An examination of thin slices of any plant, under the microscope, shows it to be composed entirely of cells; the woody tissue of trees and their bark being formed by the union of cells into tubes which are densely packed together.

The only portion of the trunk of the tree, which may be considered as living, is that thin layer of cells, less in many cases perhaps than one millimetre in thickness, which lies between the bark and the older wood of the tree. In the botanies this is called the cambium layer. It is chiefly through this layer of cells, that the juices of the tree are to be passed and repassed, which process we call the flow of the sap. Among the cells of this layer are formed the new cells, which are added either to the outer layer of wood, and form the circle of growth for the year, or to the inner surface of the bark, forcing apart its older outer surface, which by the continued pressure becomes broken and rifted as the tree grows.

If the living cells of plants froze, as we accept the term, they would burst in the manner a bottle of water bursts when frozen; but the process of freezing in plants is conducted upon a different plan.

The water before it freezes is discharged from the cells, and the crystals of ice are formed not in the cells, but outside of them, often however, tearing the tissues of the plant. This happens to nearly every annual or herbaceous plant. To-day, the great Castor-oil Beans and Cannas of our gardens are a magnificent mass of living foliage. A night frost comes, and to-morrow their leaves hang limp and lifeless. This is because the cells of which they are composed were all, or nearly all, living cells and gorged with water.

In freezing, the cells of the tissues of the plants were suddenly deprived of the water they contained, and the cells were killed either by the continued cold, or in case of a thaw, by being unable to reabsorb, with sufficient rapidity, the water of which they were deprived by the cold.

How is it, then, that the living cells of the trees are enabled to withstand cold very much more severe than that which kills the annuals of our gardens and fields?

If we cut across the trunk of any of our forest trees, we notice numerous rings, which, if counted, tell accurately the age of the tree. Favorable and unfavorable seasons may be detected by the width of these rings. In tropical countries, the rings of growth are less distinct, and in some trees quite imperceptible. This is because, in our climate, the tree, as winter approaches, prepares itself by filling the living cells with mucilaginous matter, and by withdrawing from them the water, so that these cells do not freeze, as we use the word.

In making this preparation for winter, the wood cells

formed late in the year become smaller and more densely packed together, forming quite a contrast to the coarser cell structure of summer growth. It is these lines of close-grained wood cells that enable us so easily to count the years of the life of the tree, and their absence in trees grown in tropical countries, that makes it difficult to determine their age.

As the cold becomes intense, the quantity of water in the cells diminishes. Driven from the cells, it may perhaps be frozen in crystals in some portions of the tree, or even find its way toward the heart wood. In either case, being deprived of the water, the wood contracts, and the tree breaks open as the Lime trees do on Boston Common, the crack being widest of course where the greatest contraction takes place, namely, in the newer sap wood on the outside next the bark. Or in trees having close-grained wood, the trunk may not crack open, but if the tree is cut, frozen chips will show the presence of water. That the old wood of trees contains water in large quantities, and that it may remain in seemingly dry wood for years, every one familiar with an old fashioned open wood fire well knows.

It is the absence of water in the living cells that renders the twigs of trees so brittle in winter, and the reverse condition which makes them so pliant in summer. We cannot, therefore, say strictly that the sap in plants freezes. Authorities seem agreed upon this, and also that the greater the cold the denser the solid contents of the cells left after the water has been driven out; hence, their increased ability to withstand the cold.

The greatest danger to frozen plants arises from the liability of a sudden thaw. If the thaw is gradual, the water is slowly absorbed back again into the cells which gave it up, but if the thaw is very sudden, the cells of

the plant are overtasked, and failing to absorb the water rapidly enough, are killed. This may be illustrated by the common Pelargoniums, or the Rose Geraniums, which, if thawed slowly, may be completely restored to life after being frozen quite hard; but if thawed rapidly, they are killed by the process.

The buds and young branches of our trees will also, in their dry winter state, withstand the most intense cold; but exposed to even a slight frost, after they are filled with sap in spring and growth has commenced, they are at once killed.

Our New England trees are divided into two very distinct classes: the evergreen and deciduous, divisions which are very nearly natural ones. The evergreens are nearly all Conifers, the exceptions being the Laurel, and some shrubs in the Heath family, one or two Hollies, and a few others, not conspicuous trees. The deciduous trees are nearly all Exogens, the exceptions being among the introduced species, and one shrubby, or vine-like Smilax. The leaves on the Pines and Spruces often remain on the tree three or four years, and are generally shed as the tree begins to grow in the summer. These leaves are needle-like, and very thick in proportion to their width. They become so dense in structure when fully grown, that they are capable of containing but little water, although when first formed in the spring, they are often very succulent. Our New England Conifers are, by many persons, considered very sombre in appearance, but if not too thickly distributed, they certainly add a variety to our winter landscape. Their absence would be a decided loss; and in the morning after a quiet fall of damp snow, as the sun shines over them, their beauty makes one almost forgive fate for having placed him in this half-arctic New England climate.

If the Conifers survive the winter uninjured, with their leaves *on*, it is because these leaves are almost destitute of water, so very thick, and at the same time offer so little resistance to the winds.

The Laurels and Andromedas, although their leaves are broader, follow the example of the Conifers as far as possible, and being low shrubs, they are protected by the high trees, among which they often grow.

Few, however, among our woody plants, are Conifers, or evergreens of other sorts. They are mostly trees or shrubs, having in summer broad leaves, and belong to the great class previously mentioned, the Exogens, among which are all of our hard wood trees.

But the majority of our Exogens cannot conveniently have, in summer, a broad expanse of leaves, and then contract or solidify this great leaf surface at once for winter. Thick leaves are too expensive to make for one season's use only. Then too, with such a sail set to the wintry blast, as would be presented by almost every tree, hardly one would pass through the winter without sustaining serious damage; but tattered and torn, they would be sorry objects to greet the opening of spring. These trees, therefore, must furnish themselves with a clothing of cheap leaves, which they can afford to cast off at the end of the season, to be replaced in the spring by a new suit, quickly made for immediate use.

The exploded idea, that the highly colored leaves of our New England woods in autumn are the work of early frosts, still lingers in the minds of some, reluctant to give up the old tradition. That an early frost is an injury to them, there is no doubt.

It arrests the life of the leaf prematurely. It prevents the leaf from performing its last offices in a satisfactory manner. It even may prevent the little bud that is being

formed for the next season's work from attaining perfection. It prevents the scar which is left from being perfectly healed over; and, finally, it prevents the leaf from becoming brightly colored, but instead, the frost withers it at once.

The leaf, left to finish up its work, commences at the proper time as the season advances, to deposit at the base of the leaf stem, a corky layer, which separates the leaf from the ducts or tubes, which had previously connected it with the living cells of the branches and trunk of the tree, and thence with the roots. It is now that the autumn sun ripens the materials deposited in the leaves, and produces the beautiful tints which are the charm of our New England autumn, and for which we are indebted entirely to our own native trees; those of foreign introduction, being mostly but brown or dull-colored objects at the season, when our native species are clothed in their gorgeous raiment.

As previously indicated, under different influences, the same species of trees may not always present the two phases, leafy and leafless, with which we are familiar. An evolution has undoubtedly gone on in previous time, and is still proceeding, by which evergreen trees have become deciduous. There are some trees and shrubs which possess an evergreen foliage in their natural habitat, or rather in the region where they attain their greatest perfection, but which in a colder climate become deciduous. This is the case with the Willow Oak (*Quercus Phellos*) which at the south retains its foliage until the new growth has commenced, while at Philadelphia it is regularly deciduous in autumn. There are Honeysuckles of the same habit under similar influences. Darwin speaks of the Turkish Oak (*Quercus cerris*), which by its varieties may be arranged as evergreen, sub-evergreen, and de-

ciduous. The *Magnolia glauca* is deciduous at Gloucester, but retains its leaves throughout the winter at the south. The Apple is an evergreen tree at Madeira, and the Rhododendrons, of which the hardier varieties are grown in New England, although they do not lose all their leaves annually, they persist only three or four years at the most, while in England and at the south, they often remain upon the plant seven or eight years. This is certainly suggestive that the great preponderance of deciduous trees in our climate is not the work of mere chance, but is the result of ages of slow adaptation to the unavoidable influences which surrounded their ancestors.

To one not familiar with our native trees, to recognize them in winter seems a difficult task. The wood-cutter best knows them at this season of the year, and his knowledge is chiefly derived from the appearance of the trunk of the tree, or of the wood after it has been cut.

There are many persons who have an excellent knowledge of our herbaceous wild flowers, who are absolutely ignorant of the different trees, except to distinguish, perhaps, between such strikingly different families, as Oaks and Maples, or Elms and Ashes. The Hickories and Walnuts are always confused, and many botanists are astonished when they discover, that there are fourteen distinct Willows common to our own neighborhood.

Notwithstanding the supposed difficulty of determining the different trees in summer, it is not difficult to distinguish them even in winter. A glance at the tree is often sufficient, and in some families, a few twigs, bearing the leaf-buds, will be enough to separate the species. Of course, this is not always possible, but it will answer in a majority of cases.

Winter is the only season that the system of tree-branching may be studied, and this of itself might well occupy the hour given to this paper. We might compare the angular forking of the Sassafras, with the graceful curves of the Birch. We might compare the drooping younger branches of the Elm, with the older limbs of the same tree, and wonder how any of them became erect. We might compare the upright branches of the Ash, with the spreading branches of the Chestnut, or the irregularities of the Hickory branches. We might enter into endless study to learn how and why all this branch variation came about.

Then too, in winter, we can see why it is that Spruces are spiriform, while the deciduous trees are spreading, for we can see that the continuance and more rapid growth of the terminal bud of the Spruce must produce a conical tree, while the evident early loss of the terminal bud, or its entire absence, in the other trees, shows that they must be spreading in their growth.

From the æsthetic point of view, it is surprising that so few people appreciate the beauty of the leafless trees in their winter state.

Many of them possess a grace and beauty which is wholly lost in summer when they are densely clothed with leaves, or when hidden by their neighbors.

One of our own townsmen, Mr. Very, whose rambles in the country around Salem, brought him face to face with Nature whom he loved, and whose every work he appreciated, in a sonnet to "The Tree," says :—

"I love thee when thy swelling buds appear
And one by one their tender leaves unfold,
As if they knew that warmer suns were near,
Nor longer sought to hide from winter's cold;
And when with darker growth thy leaves are seen
To veil from view the early robin's nest,

I love to lie beneath thy waving screen
With limbs by summer's heat and toil opprest;
And when the autumn winds have stript thee bare,
And round thee lies the smooth untrodden snow,
When nought is thine that made thee once so fair,
I love to watch thy shadowy form below,
And through thy leafless arms to look above
On stars that brighter beam when most we need their love."

The season of rest for the trees, however, is not of very long duration; but as the winter wanes, and the spring sun rises higher and higher, the trees reflect his influence, and long before the herbs and grasses show signs of life, or the leaves can dare appear, the trees become gorged with their juices, and to the ends of their topmost branches are visibly full of life. Few objects are at this time more conspicuous, than the golden twigs of the white Willow, or the less brilliant, but larger branches of the Poplars, which with the Birches, soon hang out their tassel-like catkins. The more humble dark-stemmed Alders follow their example. The Pines shake out their brushes, which have been rigidly drawn together to avoid the cold winds. The Pussy-willow makes bold to show its yellow anthers, for it has all winter pushed out farther and farther, as a warm day permitted, the silky white heads of its catkins. A Dandelion or two blooms in the pastures, the Arbutus and Hepatica are found hiding beneath protecting leaves. In a word, spring has come, and so it is from the time of the falling of the leaves in autumn to their reappearance in summer, we find that there is much to learn about trees in winter.

After appropriate remarks from Dr. Abbott and the Rev. E. S. Atwood the meeting adjourned, to enable the party to botanize in the woods before their return to the city.

## Monday, January 17, 1881.

At the Regular meeting this evening

Mr. Charles E. Endicott, of Boston, read a very interesting paper upon China. He began by speaking of the religions and government of China. The rationalistic philosophy of Confucius, while exerting immense influence over the nation, has failed to satisfy the innate yearnings for supernatural refuge and assistance. Consequently Tauism and Buddhism have been resorted to, though the doctrines of these sects have really no great hold on the mass of the nation. The Buddhists are the most popular of religious sects and their temples are scattered over the empire. The peculiar beliefs of both Tauists and Buddhists were given in some detail.

The Emperor, called the "solitary man," is the source of all authority and patronage. Notwithstanding his autocracy, he deems it best to have a board of advisers, in the form of two councils, termed the Cabinet and the General Council. A full account of the different subsidiary councils and the form of government was then given. After which the speaker said that science — natural, physical or mathematical — could hardly be said to exist in China. Astronomy is understood to a very limited extent, and is merely valued astrologically. There is an entire ignorance of the globe, either as regards its shape or dimensions, or the situation of foreign countries. The knowledge of mathematics is extremely limited, and is mostly studied for mercantile purposes. Chemistry and metallurgy are unknown as sciences, and the knowledge of anatomy is most crude.

In speaking of education, he said: The hope of holding official position is the chief incentive to literary attainment among the Chinese, and education consists

principally in a proficiency in the knowledge of moral philosophy. Children are placed at school at the early age of six years. Great care is taken to select a teacher of virtuous habits, which are considered as necessary as that he should be learned. An account of the examination for degrees was given.

The Industrial Arts, Fine Arts, Architecture, Army, Agriculture, Gardening, were all touched upon, and some of these treated at length. Opium smoking he thought far less general in China than is usually supposed,— the expensiveness of the drug restricting the prevalence of the custom. And though the habit obtains to a considerable extent, the results therefrom are not so pernicious and wide spreading, as is the use of intoxicating liquors in other countries.

A sketch of the life and philosophy of Confucius was given. He said the Chinese have been as faithful followers of Confucius, as Christians have been of Christ, but the absence of a vitalizing inspiration has so circumscribed the influence of the sage that the whole nation has become fossilized. There can be no doubt, had Christianity in its infancy been properly introduced into China, the natives of that country would have shown themselves as faithful in the observance of the duties inculcated by the new dispensation, as any in Christendom.

In conclusion he said, that during his long sojourn among the Chinese, he became convinced that they were entirely misunderstood by the Western world. Their respect for intelligence, as far as they are in a position to appreciate it, is quite equal to our own. Their commercial honesty is practically better than that which exists generally in Europe or America. Their industry and frugality are of the highest types. The only obstacle which retards their progress is a deathlike conservatism

which surrounds them, but when the time arrives, which is fast approaching, they will accept the teaching of a more advanced thought; a field of enterprise will then be opened in that country, which, for stupendous results, will far eclipse the most sanguine imagination of the ancients concerning the riches existing in "Far Cathay."

## Monday, February 7, 1881.

Meeting this evening. The President in the chair. Records read. Donations and correspondence announced.

Mr. James F. Almy gave an interesting sketch of his travels in Europe during the summer of 1880, with brief allusions to and observations upon the principal places visited. The following is an outline of his remarks.

Our countrymen voyaging to Europe, mingling with the awe inspired by the majesty of the ocean, speedily realize that there is a mistake in their former estimate of American nationality. We step from the pier at New York into the care of another nation. We feed the world, we supply its industries, but we have no steamships. The great ocean teaches many lessons to mind and soul which cannot be written, of the majesty and power of Him "who holdeth the waters in his hand." We sailed by the "Anchor Line" to Glasgow, touching at Moville on the Irish coast. The Giant's Causeway was passed in full view. The passengers were landed at Greenock, and proceeded by rail to Glasgow. The lack of dispatch in moving baggage, and a liquor saloon in the railroad station were noted.

Glasgow is a metropolis of monuments, fine public and private buildings, a thriving city, but also abounding in drunkenness and poverty. It was here that we met the

conductor or courier of our party. The courier is a prime convenience if not a necessity for European travel, caring for baggage, hotels, routes of travel, porters' fees, etc., etc., and especially fertile of expedients in emergencies. Our party had occasion to appreciate the services of our conductor in arranging for comfortable railway carriages for a night ride from Edinboro to Kenilworth.

The English Country Inn is a thing of precious memory to us. An inimitable breakfast, served by mine host at the inn close by the ruins of Kenilworth, was thoroughly enjoyed. A carriage ride from Kenilworth to Stratford, *via* Warwick, afforded the desired opportunity of viewing the country scenery in England.

The English lake region charms you, but most essentially through the spirit of poesy with which the bards have enthralled it. London, the great city, ancient, historic, beneficent, spangled with parks, no description of it can be given in this epitome.

We went to Holland across the North sea. Rotterdam, the Hague with Scheveningen beyond the dyke, Haarlem, and the concert at the old cathedral, Amsterdam, and the picture galleries in all these cities, the quaint dress of the people, their amphibiousness, the cattle, the windmills and dampness, are homogeneous. Passing from Holland to Germany, the latter's military spirit appears at once. The flagmen stationed at the road-crossings present arms with their flags in scabbards. Characteristics no less marked attract attention in all the nations. Cologne, in Germany, has finished her beautiful cathedral after six hundred years. I do not wonder that a simple and unlearned people are devoted to the Roman Catholic faith with its wonderful cathedrals,

"Where lights like glories fall.

The Rhine reminds one of the Hudson, minus the an-

cient towns and ruined castles. Its yellow waters would run red, if all the blood which has been shed for the control of the river was mingled with them. Weisbaden, Frankfort, Heidelberg, and Baden-Baden were visited. Most of the field work is done by women in this country.

Basel was our gateway into Switzerland, a city distinctly Swiss, but rich and prosperous, having trade with the contiguous French and German provinces. Switzerland is an inspiration; this remarkable land in the heart of the vintage world, reaching towards heaven with more than four hundred snow-clad spires,—their awful majesty, have taught the Swiss people to love their land better than any other, and liberty better than life.

Lucerne sits by her lake of the cross, reclining beneath Pilatus and the Rhigi; beyond the Brunig Pass are Interlaken, Berne, and Freiburg, the two latter quaint and strange with ancient landmarks. Lausanne and Geneva are by the bright waters of Leman, and so is the castle of Chillon with its dungeons of rock. Chamouni and Mt. Blanc are all pictured in delightful memories.

Paris merits the name of the wonderful city, but our space denies description.

The contrast between our native land and the old world lies in the value each has set upon the individual man and woman. Class distinctions across the sea have created impassable barriers. On one side the few are exalted and deified. On the other are degradation and low esteem for man and woman.

In our beloved land, the value of man and woman is set at the great price of our liberties. The priceless estimate has inspired our progress, and under God, shall, ere long, give us the leadership of the world.

Edward J. Mason, of Marblehead, was elected a resident member.

# BULLETIN

OF THE

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MONDAY, MARCH 7, 1881.

MEETING this evening. The PRESIDENT in the chair. Records read. Donations and correspondence announced.

Charles R. Wood and Lavinia D. McKeen, both of Salem, were elected resident members.

Henry F. Waters, of Salem, was elected a member of the Publication Committee, in place of James Kimball deceased.

AMOS NOYES, of Newburyport, read a paper on

"THE FRENCH REPUBLIC."

IN language and in race, the French were nearer the Americans than any people in Europe, except the English. Equality was the passionate longing of the French, and they esteemed it more than liberty, in this sentiment differing from the English who put liberty first. This was exhibited in the property laws. The French legislated so as to promote the diffusion of property, and to this end restricted the power to make wills, more narrowly than we did. France in the treatment of

religious belief (although Catholic) was much more liberal than Germany. The causes of the greater resemblance of people of the United States to France and England, than to Germany, were stated to be in closer proximity, more frequent intermarriages, comparative immunity from the full inundation of Eastern immigration. Lutheranism had always been intolerant, and by reason of the military power of Germany was now more dangerous to religious liberty than papacy. Although France was deficient in primary education, as compared with Germany, this had not prevented her from showing superior results in science, invention, production, wealth and literature. Her previous experience in political experiments had better fitted her to make a successful trial of republicanism than any country of Europe. In this connection the constitutional history of France for one hundred years was partially sketched. The previous failures were not to be wondered at, and the excesses of the French Revolution of 1789 could be ascribed to the long continued despotism under which they had suffered prior to that time. Yet in these excesses there was a striving after scientific government, except where overcome by mob violence. They had made war even on duodecimals, and had endeavored to apply the decimal system to the measurement of time, of quantity, and of weight. Napoleon I had infamously attempted to destroy all the progress that had been made toward modern notions of liberty and economy. He had endeavored to restore the ancient régime, and though starting as a democrat, had constantly tried to bring on a reaction in favor of despotism. Restoring a state church and the court ceremonial, he had finally wound up his career in a catastrophe, viz., the Russian campaign, so frightful, that it had cancelled the glory of his most brilliant exploits.

Napoleon III had been for a time brilliant and successful, but finally dimmed at Sedan all the prestige that remained, and the death of his son had removed the apprehensions of another usurpation from that dynasty. The French had failed generally from want of those checks and divisions of functions in government, which history has shown were indispensable. A single house of legislature, consisting of 750 members, had been their cause of failure. It was tumultuous, unwieldy in size, and a prey to factions. To illustrate the faults of such a constitution, the instances of Spain, Switzerland, Rome and the French Assembly were cited; and, on the other hand, the stability which was gained by the duplex system was illustrated by the city governments of England and America, the state constitutions, and the Federal system. There were three reasons why, independent of experience, we were warranted in expecting better results from the duplex system.

1. Because two houses differ in constituency and the principle of representation, thus affording greater scope for talent.

2. Two houses gave publicity to legislature, and thus furnished a check to bribery and fraud.

3. They prevented hasty legislation.

There was in France special necessity to guard against impulsiveness. The audacity, violence, and impetuosity of French orators and statesmen were then described, and attributed in part to a dramatic and histrionic character which expressed more than it felt. France had learned by experience to establish two houses of legislation, and since the establishment of the senate had shown great patience and conservatism.

There were still those who, notwithstanding the promising prospect for the republic, were faithless. These

persons brought up Napoleon, the menacing attitude of Germany, the consequent necessity of maintaining a large standing army, the vast centralization of power at Paris, and the immense patronage that must be intrusted to the executive. Bonapartism seemed dead beyond power of resurrection. The army could be reduced when Bismark and Moltke died. The methods of these men were short-sighted efforts to introduce a Lycurgean system, and to foster masculinity. With a reduction of the army a diffusion of patronage could take place in France and the administration be decentralized. Others objected that the illiterateness of France was so great as to render a representative government inexpedient. But our ancestors in ante-revolutionary times were more illiterate, and yet their government was wise and prudent. France needed a strong government it was said, and this was true ; but it did not mean a despotic or an imperial, or a military government. Despotism was weak financially, and could not indulge in philanthropy or education. The weakest governments to-day were Turkey, Russia and Germany. Any month might bring tidings of revolt and insurrection, in the first two of revolution. Great Britain's government, by reason of the prevalence of aristocratic and monarchical influences prior to 1832, had been unable to prevent secession, and was so hostile to the people as to have provoked many insurrections in the island, which defied for weeks the whole power of the government, and caused much weak and pernicious legislation. Although Great Britain and Spain had lost their colonies, and the government managed so poorly as to fail to obtain support by reason of the aristocratic bias which controlled every measure, France with republican energy was able to put down revolt in La Vendee ; Switzerland held in allegiance seven cantons which were bent on secession in 1832 and

1846, and the United States was able to subjugate a rebellion which covered half its territory and embraced one-third of its people. In short, republics were stronger than aristocracies or imperialism in dealing with rebellion, in obtaining revenue, in enforcing taxation, and in giving security to property and virtue.

These objections met, it yet remained as an objection, alleged that France was hopelessly given over to the vagaries of socialism and communism. There was little or no socialism in France, though in Germany and Russia socialists were numerous. Socialism and communism were irreconcilable enemies. Though they were often ignorantly confounded, socialism would annihilate private property and prevent competition. This would be fatal to progress, and could only be done by forming associations. Communists recognized competition and the right of private property, but believed that government should do all things which could be best done by it, and had the right to burden property by many taxations. Literally rendered, extreme communism was township government carried into all kinds of administration of business. In effect, perhaps, extremes in communism and socialism would meet, if ubiquitous; for the tremendous taxations necessary to the full realization of the philanthropic and sentimental objects of extreme communists would as effectually destroy private property as its direct inhibition. But while in republics socialism becomes extinct, communism becomes modified and takes charge of politics. Communists desired sidewalks, lighted streets, mail facilities, public schools and baths, colleges supported by public expense, and more authority in local governments. The most communistic countries in the world were the northern tier of states of America. The communistic spirit

had taken deep root in our law. Towns and states did more and more business every year. Such things as were now commonly furnished, viz., free libraries, free baths, free reading rooms, would be regarded in England as grossly communistic, if supported by taxation, although now looked upon as usual here. This bugbear of communism was, in fact, the practice more or less of all countries above semi-barbarism. In republics controlled by the common sense of the people, these principles were synonymous with republicanism, and had not gone too far. There was great need of the localizing principle with which communism started in France. As matters now stood, the national administration at Paris determined courses of study and selected teachers for towns distant from Paris.

In the exercise of the suffrage, the French system resembled England more than America. Their executive did not have fixed tenures; even the President, though chosen for a term, deemed it necessary to resign, when the assembly and senate were both against him.

The probability of the success of republicanism arose out of the present tendencies of the age, enumerated as the relative increase of personal property; the instability this imparted to inherited position and vested interest; the educating influence of railroads and inventions; the increasing interchange of ideas. These influences tended to obscure national lines, and render possible a United States of western Europe. There was a growing similarity of law and custom, and a mingling of business interests which favored this. The government of Great Britain was in reality an aristocratic republic. Her example was a warning to all. Everything done there cost two to three times as much as it did in republics. Salaries paid to the principal officers were disproportionate,

and the island was infested with sinecure offices. Republics were more economical, more humane, and more just. And the example of France and America was a painful contrast and cogent argument against the aristocratic and monarchical governments of Great Britain, Germany and Austria. It was true there were some seeming failures. New York city was called a failure, but New York city is in reality an imperialism. Not democracy, not republicanism were on trial, but bureaucracy and one man government. The Mayor was an emperor in disguise. There should be at least three hundred councilmen to prevent fraud, and there should be sixty aldermen, and these should really be the legislature of New York.

There was an essential difference between the American and English or European idea of government. The English regarded government as a kind of pageantry. America regarded it as a business.

The introduction of minority representation, as practised in Illinois, was hoped in France. It was an ideal system of perfect representation, and was essential in order to get perfect justice done. If there were 240 members to the house of representatives, and 100,000 democrats and 200,000 republicans, minority representation by the cumulative system and triple districts, would give democrats 80, and republicans 160 of these representatives. The French would be successful, and would even show improvements in reference to voting and deliberative assemblies which would be of value in this country. Republicanism, struggling amid military monarchies, was indeed in perilous straits, but had the sympathy of the oppressed subjects of feudalism.

## Monday, March 21, 1881.

Meeting this evening. The President in the chair. Records read. Donations and correspondence announced.

Mrs. Eliza Stevens Low and Miss Elizabeth B. Perkins, both of Salem, were elected resident members.

Mr. J. P. Cowles, of Ipswich, gave an informal talk on China. His special subject was "In and about Pekin." Some fifty-five lantern pictures were thrown upon the screen by Mr. George L. Newcomb, exhibiting to the audience the usual appearance and daily scenes of that city, the streets, buildings, people, carriages, sedan chairs, temples, tombs, idols, etc., each picture being briefly and clearly explained by the speaker, whose long residence in and close observation of that country and its people, well qualified him for this duty. Some of the characters of the Chinese language were shown and described. Mr. Cowles' manner in conducting the exercises of the evening was very happy; the eliciting of replies from some of the audience, especially of the younger portion, to appropriate questions, led to suggestions and trains of remarks that added much to the interest and instruction of the evening's talk.

## Monday, April 4, 1881.

Meeting this evening. The President in the chair. Records read. Donations and correspondence announced.

William Amasa Keese, of Salem, was elected a resident member.

Rev. George Frederick Wright read a communication entitled,

## THE GLACIAL PHENOMENA OF NORTH AMERICA AND THEIR RELATION TO THE QUESTION OF MAN'S ANTIQUITY IN THE VALLEY OF THE DELAWARE.

(ABSTRACT.)

The speaker remarked that since it was his privilege to present to this Society in Dec., 1875, his first paper on the gravel deposits of Eastern Massachusetts, he was glad to appear again before them to report progress and show to what the subject has led the way.

Upon this map [referring to a map $15 \times 15$ ft. which the speaker had prepared], the extent of the glaciated region in North America is exhibited, and several of its most important features delineated. The boundary line of extreme glaciation passes through Long Island, across New Jersey to Belvidere, through northern Pennsylvania, there bends south through southern Ohio, Indiana, and Illinois. On crossing the Mississippi, it sweeps northwestward to the upper waters of the Missouri.

The whole region above this line is covered, at least in areas, with till — a compact clay, bearing pebbles and boulders which are occasionally scratched. Above this line, also, the rocks show in favorable situations the smoothed and striated surfaces peculiar to glaciated regions.

On passing south from this line, the superficial deposits change, the rocks are not striated, but show solely the effect of disintegrating influences acting from the surface.

As you see by the arrows, which mark the observed direction of the striæ, the ice-sheet radiated from the highlands south of Hudson Bay, moving along the lines of

least resistance. Near the Atlantic coast the movement tended to be at right angles to the shore, and in the valley of the Mississippi the movement converged somewhat towards the axis of the valley. For a time, however, there was a movement up the valley of the St. Lawrence, and parallel with the axis of Lake Erie.

Upon this map of New England (10 × 10 ft.) is shown the system of gravel ridges, or "kames," explored since I described Indian Ridge in 1875. These investigations have been carried on chiefly by Mr. Warren Upham of the New Hampshire Geological Survey, Prof. George H. Stone of Kent's Hill, Maine, and myself. It appears that in passing from New Brunswick to the Connecticut river, parallel to the shore, forty or more series of gravel ridges are crossed. The direction of these conforms closely to that of the glacial striæ, and they are in the main parallel with one another. While following in general the direction of the valleys, they sometimes cross them and pass over moderate elevations. The kames frequently begin near the mountains at a height of 1000 or 2000 feet above the sea, and are continuous for 100 or more miles to the coast. The material often varies somewhat abruptly in the same series, changing from sand to coarse pebbles a foot or more in diameter, while frequently larger boulders are embedded. Usually the sand and gravel are in a reticulated belt of ridges from twenty to one hundred feet high, standing at as sharp an angle as the material will allow. But frequently the ridges give place for a time to extensive plains of sand and gravel; and near the shore they usually end in such plains. These lines of gravel deposit are also marked by numerous "kettle holes," of which the dungeons near Marblehead are a good example.

The most probable theory concerning the formation of

kames is that they mark the course of the floods which must have characterized the last stages of the glacial period (the Champlain Epoch). When but a few hundred feet of the ice was left, the earthy material which had been held in the whole mass must have rested in places in a thick deposit upon the lower stratum of ice, and must have been brought into lines of special depth through previous action of superficial currents of water. At this time the remaining ice frequently obstructed the natural outlets to the floods, so that they were to a considerable extent independent of the present river channels, though not of the larger valleys. The final result was, that when the various ice barriers were removed and the water sought its present lines of outflow, these previous gravel deposits of the glacial rivers were left undisturbed, except where the changed course of the water-flow led across their path and eroded them. In places, doubtless, the earthy material had been deposited in ice channels; in which case a ridge would be formed when the sides melted away. In other places vast masses of ice would have been so covered with sand and gravel that the melting would be greatly delayed. In such cases the earthy material would settle down in a very irregular manner, forming the characteristic reticulated ridges and the frequent kettle holes where the material had slid off on every side and left an enclosed mass of ice to melt away gradually.

Soon after beginning to investigate the kames, my attention was directed by Mr. Clarence King to a terminal moraine on Cape Cod and the Elizabeth Islands. His communication to me was published in my paper before the Proceedings of the Boston Society of Natural History, for Dec., 1876. Upon hearing of this Mr. Upham at once visited the locality, and found that a terminal mo-

raine forms the backbone of Cape Cod, of the Elizabeth Islands, and of Long Island. Professors Cook and Smock, about the same time, traced its course across New Jersey. Somewhat earlier, Professors Whittlesey, Winchell, Chamberlain, and Irving had identified it in the "kettle range" of Wisconsin.

This moraine is a line of hills from 100 to 300 feet high running at right angles to the direction of the ice flow and of the kames, is composed of both stratified and unstratified material, contains scratched pebbles, and usually has angular boulders of great size upon its surface. Kettle holes are likewise abundant along its course and frequently of great size.

During the past two years, Mr. Upham has traced a similar line of hills in a loop, following down the lake region in Minnesota to Minneapolis, thence to the vicinity of Des Moines in Iowa. There it bends to the north-west, crossing the Minnesota line near the south-west corner of the state and continuing as the Coteau des Prairies in Dakota. The upper part of the Minnesota river is midway between the eastern and the western line of this loop. The distance from one side to another is about seventy miles.

It is evident from a glance at this map that during the closing part of the glacial period all the drainage which now empties into Hudson Bay poured down through Lake Traverse and the Minnesota river into the Mississippi. This is also proved directly by the size of the Minnesota valley and the extent of the gravel deposits on either side of it. At the same time, the waters of the St. Lawrence were obstructed by the ice to the north, and poured mainly into the Mississippi through two south-western outlets, one from Lake Michigan through Illinois, the other from Lake Erie through the Maumee and the Wa-

bash. The marks of this enormous accumulation in the channel of the lower Mississippi are seen in the bluff deposits and the Orange sands, investigated by Prof. Hilgard.

Coming east, the first river entering the sea below the boundary of the glaciated region is the Delaware. This has a small drainage area, and is so situated with reference to the Catskill Mountains and the Alleghanies that even in glacial times it never could have been reinforced by northern ice accumulations like the rivers farther west. The terminal moraine crosses the Delaware at Belvidere, a few miles above its junction with the Lehigh and a few miles below the Delaware Water Gap. The portion of the drainage basin above this point does not exceed 6000 square miles. Still the melting of the 2000 or 3000 feet of ice which accumulated over that area must from the nature of the case have produced important results in the valley below. Following down the river from Belvidere about sixty miles, we descend something over 200 feet to tide level. Through this distance, the valley is somewhat constricted, and the river is everywhere bordered by a terrace of coarse gravel from fifteen to twenty feet above present high-water mark. At Trenton, where tide level is reached, this gradually passes into an extensive accumulation three miles wide and more than forty feet above high-water mark. It is here, in the accumulation of coarsely stratified pebbles and gravel and sand, that Dr. C. C. Abbott has found so many palæolithic implements. Below Trenton the formation gradually diminishes and grows finer until at Philadelphia it is scarcely distinguishable. This accumulation of river gravel is entirely distinct from the deposits of yellow gravel which cover southern New Jersey. It is later also than the Philadelphia brick clay. This clay

contains boulders of large size from up the river, and is found for a long distance at a height of one hundred and fifty feet. These facts were discovered by Prof. H. C. Lewis, of Philadelphia, by whose courtesy I am allowed to present them and with whom I have been permitted to spend two weeks in reviewing the field. The conclusion is that the gravels containing flint implements at Trenton mark the closing stages of the glacial period, when water was excessively abundant from the melting of the ice, and pebbles for transportation were at hand in the freshly deposited kames and moraines of the glacial region above. The evidence is conclusive that man was in New Jersey before the glacial period. How much before we have no means of determining.

The remaining question is, When did the ice of the the glacial period disappear?

Evidence accumulates that this period is more recent than has been currently supposed. In the Am. Jour. of Science for Feb., 1881, I published a paper in which an attempt was made to estimate the age of a kettle hole in Andover, similar to the dungeons in Marblehead. This kettle is three hundred feet across at the top, and about sixty feet deep. The bottom is filled with a peat bog ninety feet in diameter. It is scarcely possible for it originally to have been more than twenty-five feet deeper than it is at present. This would represent a deposit upon the present surface of the peat of only eight feet. If the kettle was formed at the close of the glacial period it would hardly be reasonable to place that epoch back 80,000 or 100,000 years as is now customary upon astronomical grounds. For if we suppose the kettle hole to have existed 80,000 years we are compelled to believe that 1,000 years would be required for an inch of solid matter to accumulate upon the present surface of the peat,

where not only the growth of vegetable matter but the wash from the sides and the dust blown by winds would unite their forces to augment the rate. If the origin is placed 10,000 years back that would imply a rate of accumulation sufficiently slow, namely, an inch in one hundred years.

United with this calculation is that of Prof. N. H. Winchell, concerning the recession of the falls of St. Anthony. This cataract has receded about eight miles since the close of the glacial epoch. The old channel from Minneapolis to the Minnesota river is west of the present gorge and is filled with glacial débris. Since the falls were discovered by Hennepin in 1680 the recession has been about 1,000 feet, an average of about five feet per year. This would give only about 9,000 years for the erosion since the glacial epoch.[1]

To geologists, probably the gorge below Niagara Falls has been the most convincing evidence of the great antiquity of the glacial age. A preglacial channel exists below the Whirlpool, reaching Lake Ontario at St. Davids, some distance west of the present mouth of the river. This old channel was filled with glacial *débris*, so as to turn the water into its present course. In 1841 Professor Hall and Sir Charles Lyell, assuming that the whole gorge, from Lewiston to the present falls, had been formed since the filling up of the channel below the Whirlpool, estimated that the smallest amount of time which would suffice for this task was 30,000 years, and that probably a much longer period was consumed; but these eminent observers overlooked one circumstance of the very greatest significance, to which the late Mr. Thomas G. Belt has called attention. This paper (which

[1] See Fifth Annual Report of the Minnesota Geological Survey, pp. 156–189.

is very important) may be found in the London *Quarterly Journal of Science* for April, 1875. There is nothing to show that the portion of the gorge extending from the Whirlpool up to the present site of the Falls is not also preglacial, but many things to indicate that it is the true continuation of the old preglacial channel. The distance between the present cataract and the Whirlpool is about four miles, or half that of the whole gorge, and the position of the strata is such that through this portion of the gorge the rate of retrocession must have been much slower than that below the whirlpool. One of the evidences that this upper portion of the channel belongs to the preglacial times is that it is much wider than that from the Whirlpool to Lewiston. Now, if we suppose that, when the cataract had worn out the gorge from Lewiston to the Whirlpool, it struck the preglacial gorge and above that point had simply to scour out the loose material from it, the measure of the time since the glacial age is that required by the river to form the gorge below the Whirlpool plus so much of the upper end as was not already in existence. What this last element is we have no means of telling precisely, but the time required for eroding the lower section could scarcely have been more than 20,000 and very likely was less than 10,000 years, that being very much the easiest part of the work to be done.

The thing which the investigations of Dr. Abbott and Professor Lewis have settled is that man was in America before the close of the glacial epoch, so that now any investigations which help to assign a date to that period, help to determine the minimum chronology of man's existence on this continent. The kames and moraines of New England furnish a promising field in which to look for further evidence upon this most interesting question.

At the close of the reading of Mr. Wright's paper, Prof. EDWARD S. MORSE spoke in complimentary terms of the paper of the evening, and endorsed in the main his conclusions. He hoped that the Institute would hear occasionally from Mr. Wright as his investigations progress.

Adj.

MONDAY, APRIL 18, 1881.

MEETING this evening. THE PRESIDENT in the chair. Records read. Donations and correspondence announced.

Messrs. Geo. A. Perkins, T. F. Hunt, and D. B. Hagar, were appointed on the committee to nominate the list of officers for the coming year, to be balloted for at the annual meeting.

PROF. ISAAC J. OSBUN, of the State Normal School, gave an interesting lecture in the hall on "Science teaching in the schools." Many experiments were performed to illustrate fully the various remarks suggested in the course of his lecture.

MONDAY, MAY 2, 1881.

MEETING this evening. The PRESIDENT in the chair. Records read. Donations and correspondence announced.

PROF. EDWARD S. MORSE occupied the evening with a very interesting and familiar talk on a new invention

(of his own contrivance, and for which a patent has been applied for), for using the sun's rays as a means of heating and ventilation. He mentioned that he had in use at the hall of the Peabody Academy of Science in this city, a simple apparatus, that had effected a marked change in the ventilation; by means of which fresh air was introduced into the building, and the air as it entered the room, by the utilization of the sun's rays, was from fifteen to thirty degrees, Fahrenheit, warmer than when it entered the apparatus from the outside. A small model of the apparatus and ample drawings on the blackboard fully illustrated his remarks.

Prof. I. J. Osbun, of the Normal School, asked several questions which were satisfactorily answered by Professor Morse and contributed much to render the account more interesting and instrutive.

Before commencing his talk, Professor Morse referred in a very pleasant manner to the lecture of Professor Wright at the last meeting of the Institute, on the "Glaciation of North America and its bearing on the Antiquity of Man in New Jersey." Professor Morse endorsed the statements of Mr. Wright, and said that during a recent call on Dr. Abbott, who is making investigations in the Delaware valley, he had found several of the chipped-stone implements which he had described. Drawings of these stones were made on the blackboard.

Adj.

# *A List of the Birds of the Hudson Highlands, with Annotations.*

By Edgar A. Mearns.

[Continued from Vol. XII, page 128.]

## Family, ARDEIDÆ.

**150. Ardea herodias,** *Linné.* Great Blue Heron. A summer resident; abundant during spring and fall migrations; probably breeds. Arrives in April (26, 1874; 21, 1876; 4, 1877; 11, 1878). Departs the last of September, or later (September 20, 1876; 23, 1878; 25, 1879). A fine male was shot on Consook marsh on the 12th of December, 1880, when the temperature was low, and the Hudson frozen along shore, and the mountain lakes and ponds entirely closed.

This large and beautiful Heron remains in the Highlands during the breeding season and throughout the summer. I frequently see it flying over my house, towards the mountain, just at evening; but where it builds its nest, I have never discovered. Its large tracks are seldom absent during spring and summer, from the muddy margins of our solitary ponds. In general it is quite shy, flying away on the first approach of mankind; but, by seeking concealment and awaiting its return, its interesting habits can be studied. Soon it may be seen flying back, just skimming the tree-tops, and sailing slowly down over the pond. As it approaches the spot where it wishes to alight, it assumes a perpendicular position and holds its legs straight downward, and seems really to have alighted, but still glides onward, then actually settles, sinking in the water nearly up to its body. Then it casts a cautious glance around, and, should it descry any dangerous object, instantly betakes itself to flight, with heavy flapping of wings, soon mounting well up in the air. Should a number of Herons be present, as is the case during migrations, they may be seen chasing one another, dancing and executing various amusing antics.

*Dimensions.* — Measurements of No. 1,773, ♀ juv., September 23, 1878, Hudson River, at Cornwall, E. A. M.: length, 43·75; stretch, 69·50; wing, 16·75; tail, 7·00; length from tip of bill to end of longest toe, 59·00; culmen, 5·20; gape, 6·65; tarsus, 7·10. Measurements of

No. 2,172, ♂ ad., December 12, 1880, Consook Island, Hudson River, N. Y., E. A. M.: length, 47·50; stretch, 74·00; wing, 18·55; tail, 7·50; length from tip of bill to end of toes, 63·00; culmen, 5·80; gape, 7·35; bare part of tibia, 4·95; tarsus, 7·30; middle toe and claw, 5·10; middle toe alone, 4·45; its claw, ·70.

**151. Herodias alba egretta,** *Gmelin.* American Egret. A summer visitant. Observed at Cornwall, and at Cold Spring, in the Highlands. A specimen was shot at Yonkers, N. Y., in autumn, several years ago. Dr. A. K. Fisher recorded (Bull. Nutt. Orn. Club, Vol. IV, No. 1, p. 62) its capture at Sing Sing, on the Hudson; he also informed me verbally of one shot near Newburgh, N. Y., doubtless of this species, although not personally examined.

**152. Butorides virescens,** *Linné.* Green Heron. An abundant summer resident; breeds plentifully. Arrives about the last of April (27, 1873; May 22, 1874; 3, 1875; 3, 1876; 7, 1877; April 22, 1878; May 15, 1879; 13, 1880; 11, 1881), and departs in October.

The Green Heron builds its nest early in May. Its eggs are commonly deposited during the third week, although I have found them in June, and even July (4, 1872). It occupies the old nest season after season. Its eggs vary in number from four to six. On May 22, 1878, I found a very pretty nest, built in a festoon of grape-vine, swinging free over a pool in a swamp. The eggs were six in number, and incubation was considerably advanced.

*Dimensions.*—Average measurements of five females: length, 17·75; stretch, 26·75; wing, 7·19; tail, 3·00; culmen, 2·28; tarsus, 2·00; middle toe, 2·06; its claw, .34.

**153. Nyctiardea grisea nævia,** *Boddaert.* Night Heron. A summer resident; breeds.

The Night Herons have established several breeding-places along the Hudson River. One of them is located in a large swamp of maple and birch saplings, with occasional large maples and groups of tall pine-trees, on Constitution Island, in the Hudson River. Dr. F. D. Lente, of Cold Spring, first informed me of its existence, in the spring of 1873. I first visited the Heronry on June 4th. After proceeding a little way into the swamp, we were startled by the loud "squawking" and flapping of the Herons; and we immediately discovered a large number of their nests. As we advanced, every limb and crotch that was at all adapted to hold a nest was occupied. The birds were flying wildly about, and the air was filled with their discordant croaking. Now and then a sound like the barking of a dog was heard. We were astonished at the number of birds and nests, but were rather late for collecting the eggs, as the nests nearly all contained young, or eggs nearly hatched. The Herons offered no resistance when their nests were being pillaged, but sat around in trees at a short distance. We

examined a large number of nests, by climbing to one and then swinging to the nearest on the maple and white-birch saplings on which the nests were constructed. The young, none of which were more than two or three days old, were covered with gray down. The nests contained from one to four eggs each, and in three, which I examined, five eggs were found. Crows destroy their eggs, and to some such accident the lesser numbers of eggs was probably due. The ground was strewn with dead birds, which had been cruelly shot for sport.

On June 26, 1873, I again visited the Herons, examining many of their nests, most of which were deserted, however; but two nests contained three eggs each, perfectly fresh, which were probably a second brood, belonging to birds whose first nests had been spoiled after the first laying. Other nests were still occupied by fat young ones, that seemed to enjoy climbing to the extremity of the branches about the nest, and to the top of the tree, dropping or scrambling rapidly back into the nest, as I approached. Their irides are narrow; color, light carmine. By the 26th of August the Herons had all left the swamp. The atmosphere was foul from the stench arising from the decaying Herons, which were lying in numbers upon the ground, having been shot in mere wantonness by the gunners. Dead fishes were also strewn about. I noticed five different species which the Herons had brought to the swamp.

On the succeeding season (1874) only one or two pairs of Night Herons had the courage to return to the old breeding-place, where they had been so cruelly treated; but those birds reëstablished the Heronry, and founded a city upon the ruins of the past, which has been the happy home of hundreds of prosperous "Squawks" ever since. Their swamp is a long stretch of oozy land, at the east side of Constitution Island; and their best friends are the lady owners of the island—the Misses Warner. The trees are mainly saplings; and on the top of each is placed a bulky nest, composed of sticks, which are arranged in an orderly manner, making a pretty, clean receptacle for the eggs, which vary in number from four to six, are bluish-green in color, and measure $2{\cdot}25\times1{\cdot}55$ of an inch. They arrive from the South during the first or second week in April. The old nests are carefully repaired; and during this busy time the birds fly back and forth, industriously carrying sticks and arranging them carefully in their nests, so as to form a good-sized basin, sufficiently concave to prevent the eggs from rolling out in case of high winds. Curved twigs are selected, and so placed as to radiate from the centre outwards, with their concavity directed upwards. This disposition of the twigs gives to the outside of the nest a rather bristling aspect. Some branches have green leaves attached to them, showing that the builders break them off from the living tree. One nest was quite well

lined with loose green leaves, plucked from a neighboring tree. Four or five is the usual complement of eggs; but six were taken from one nest, on May 23, 1877. In flight, the Heron's neck is retracted so that its head nestles upon its shoulders, and its legs extend straight behind, looking like a couple of long, central tail-feathers. Sticks, for building, are carried crosswise in its beak. Oviposition begins early in May; but (as I have also observed in young birds of other species) the immature Herons breed somewhat later than do the patriarchs of the settlement, and these newly-wedded birds may be found having fresh eggs late in the month.

As one enters the swamp, the sitting Herons leave their nests with heavy wing-strokes, and loud *quawk-quawk*, which, as they alight in distant pine-trees, are followed by a series of guttural, and barking sounds. When shot they usually clutch the first branch they strike, and cling to it as long as life remains. One that I shot as it flew overhead lodged in a tree-top, holding on to a branch with its feet, with body hanging down; soon, however, it managed to hook its bill over the limb, and finally got upon the branch, and sat erect, but suddenly fell off its perch quite dead. On the ground, they attempt to escape by running swiftly through the patches of tall ferns, brakes and bushes, which grow so abundantly in the swamp. One of my shots broke the wing of a flying Heron. It fell to the ground, and ran through some beds of high ferns, croaking so fearfully that I soon had the entire Heronry "squawking" over my head, as I pursued my wounded bird. At length it squatted, but as its white plumage could not readily be concealed, I caught it, and ended its existence, after no tame struggle on the Heron's part; meanwhile its cries were deafening.

Night Herons breed while still in immature plumage. A male in the dress of the second season was shot while carrying a stick to its nest, on May 23, 1877. It sailed into a distant tree, where I discovered it sitting upright, with neck drawn in. Soon it grew weak, swayed from side to side, at last drooping, as life became extinct, but still clinging to the branch, although I found it quite dead on climbing up to dislodge it. In this stage, its eyes are light red. In still younger birds, during the first autumn, the iris is straw-color; but, as I have previously stated, the nestlings have very light red irides. While I sat in the tree-top examining my prize, a fine old bird alighted close beside me, standing erect, with crest alternately raised and depressed—the only expression of a fear so intense as to paralyze every muscle. It sat erect, with neck extended. I noted especially the beauty and brilliancy of its eye, and that the long occipital feathers fitted together so as to present the appearance of a single long plume, hanging over the back and down by its side. At

my first movement the spell was broken, and the Heron flew away with a squawk that awoke the echoes. At first its legs dangled; afterward they were extended straight out beyond its tail.

Night Herons feed almost exclusively upon fishes and batrachians. They are frequently seen flying along the Hudson during summer evenings. I also see them, throughout the summer, about some ponds near my residence. They depart during September. They breed in the Central Park, New York City, where I have seen one as late as November 2, 1880. I also shot an adult bird at Sayville, Long Island, on October 6, 1880. I know of four large Heronries along the Hudson River. The largest one, judging from accounts of it, is at, or near, Low Point, in Dutchess County. Another, the highest up the river, is located on a low island, below Albany, where Mr. Robt. T. Morris has taken its eggs, and where I saw the birds in abundance, during the breeding season, in 1875.

*Dimensions.*—Average measurement of eleven adults: length, 26·18; stretch, 45·85; wing, 12·00; tail, 4·75; length from tip of bill to end of toes, 33·55; bill from nostril, 2·11; culmen, 3·06; gape, 4·22; length of nasal orifice, ·67; tarsus, 3·29; hallex, 1·30; its claw, ·77; inner toe, 1·92; its claw, ·58; middle toe, 2 90; its claw, ·57; middle toe and its claw, 3·55; outer toe, 2·14; its claw, ·46; length of occipital plumes, 8·33.

**154. Botaurus lentiginosus,** *Montague.* American Bittern. A spring and fall migrant; possibly remains during summer, and breeds.

**155. Ardetta exilis,** *Gmelin.* Least Bittern. The late Frederic S. Osborn found this species near his residence, at Garrisons, on the Hudson, in spring.

## Family, CHARADRIIDÆ.

**156. Charadrius dominicus,** *Müller.* American Golden Plover. Only observed as an autumnal migrant. Shot at Cornwall.

**157. Oxyechus vociferus,** *Linné.* Kildeer Plover. Rare during migrations.

## Family, SCOLOPACIDÆ.

**158. Philohela minor,** *Gmelin.* American Woodcock. A very abundant summer resident; breeds. Arrives early in March, and departs late in November.

This glorious game-bird infests all of our swampy swales and meadows, and affords rare sport to the gunners. It reaches us by the beginning of March, unless the season should be backward, and breeding begins early. The young ones are running about early in

April. Its nest is merely a bed of leaves, and sometimes not even that make-shift of a nest is used, but the eggs are deposited directly upon the bare ground, as in one case where I found four eggs lying upon the black earth, between two surface roots of a cedar-tree.

John Lawson, in his "New Voyage to Carolina," printed in the year 1709, gave the following quaint information concerning the habits of the Woodcock and his appreciation of its flesh: "The Woodcocks live and breed here, though they are not in great plenty, as I have seen them in some Parts of *England* and other Places. They want one-third of the *English* Woodcock in Bigness; but differ not in Shape, or Feather, save that their breast is of a Carnation Colour; and they make a Noise (when they are on the Wing) like the Bells about a Hawk's Legs. They are certainly as dainty Meat as any in the World. Their abode is in all Parts of this Country, in low, boggy Ground, Springs, Swamps, and Percoarsons."

**159. Gallinago media wilsoni,** *Temminck.* Wilson's Snipe. A common spring and fall migrant. In autumn, most abundant during October. In spring, I have taken it as late as April 19 (1879).

*Dimensions.*—Average measurements of four males: length, 10·78; stretch, 16·90; wing, 5·09; tail, 2·30; culmen, 2·46; tarsus, 1·20; middle toe, 1·18; its claw, ·28.

**160. Ereunetes pusillus,** *Linné.* Semipalmated Sandpiper. A migrant. Two specimens were shot from a flock on September 25, 1879, near Cold Spring.

*Dimensions.*—Average measurements of two males (Nos. 2,000 and 2,001, ♂ ♂ ad. ad., Cold Spring, N. Y., September 25, 1879, E. A. M.): length, 6·03; stretch, 11·83; wing, 3·66; tail, 1·57; culmen, ·68; gape, ·67; tarsus, ·81; middle toe, ·59; its claw, ·12.

**161. Totanus melanoleucus,** *Gmelin.* Greater Yellow-Legs; Tell-Tale. A spring and fall migrant.

**162. Totanus flavipes,** *Gmelin.* Yellow-Legs. A spring and fall migrant. Both species of *Totanus* occur in occasional large flocks, during migrations, but neither can be said to be common.

**163. Rhyacophilus solitarius,** *Wilson.* Solitary Sandpiper. Abundant during migrations, and late in summer. Arrives in April (25, 1874), and remains until late in May (24, 1874; 19, 1876; 15, 1877). About midsummer it again appears (July 6 and 20, 1874), and remains until October (15, 1876; September 25, 1879).

This species is of occasional occurrence along the river-bank, and usually quite abundant about small inland ponds.

*Dimensions.*—Average measurements of six males: length, 8·36; stretch, 16·33; wing, 5·20; tail, 2·30; culmen, 1·11; gape, 1·25; tarsus, 1·20; middle toe, ·96; its claw, ·19.

**164. Tringoides macularius,** *Linné.* Spotted Sandpiper.

A common summer resident; breeds. Arrives in April (May 9, 1874; April 26, 1875; 29, 1876; 30, 1877; 20, 1878; 19, 1879; 20, 1880; May 8, 1881), and departs in October.

*Dimensions.* — Average measurements of eleven adult specimens: length, 7·87; stretch, 13·67; wing, 4·30; tail, 2·13; culmen, ·95; gape, 1·03; tarsus, 1·93; middle toe, ·83; its claw, ·19.

## Family, **RALLIDÆ.**

**165. Rallus longirostris crepitans,** *Gmelin.* Clapper Rail. Occasionally shot in autumn.

**166. Rallus virginianus,** *Linné.* Virginia Rail. A summer resident; breeds.

**167. Porzana carolina,** *Linné.* Carolina Rail; Sora. A summer resident; breeds.

*Dimensions.*—Average measurements of fourteen specimens: length, 9·00; stretch, 14·30; wing, 4·35; tail, 2·25; length from tip of bill to end of toes, 12·75; bill from nostril, ·44; culmen, ·89; gape, ·90; tarsus, 1·36; middle toe, 1·43; its claw, ·35; middle toe and claw, 1·75.

**168. Gallinula galeata,** *Lichtenstein.* Florida Gallinule. A summer resident. Mr. Francis Butterfass, of Cold Spring, has a mounted specimen which he shot near Cold Spring, on the Hudson. Mr. Winfrid A. Stearns states (List of Birds in the Vicinity of Fishkill-on-Hudson, N. Y., 1880) that a single specimen was shot at Fishkill, on the Hudson. Bonaparte observes (Wilson and Bonaparte, American Ornithology, Vol. III, p. 402, 1828): "In the middle and northern United States it appears to be quite accidental; for, although a few well authenticated instances are known of its having been seen and shot, even as far as Albany, in the State of New York, it has escaped the researches of Wilson, as well as my own. It is by no means, therefore, a common bird, and is not known as inhabiting arctic America, ranging much less to the north, even as a straggler, than its European analogue."

**169. Fulica americana,** *Gmelin.* American Coot. Abundant on the Hudson River in spring and fall.

*Dimensions.* — Measurements of No. 800, ♂ ad., Hudson River, October 11, 1875, E. A. M.: length, 14·50; stretch, 26·00; wing, 7·19; tail, 1·94; length from tip of bill to end of toes, 20 00.

## Family, **ANATIDÆ.**

**170. Olor americanus,** *Sharpless.* American Swan; Whistling Swan. An occasional visitant. Dr. A. K. Fisher informed me

that one was shot, several years since, on the Hudson River near Newburgh, by a gunner, who brought it to the house of his aunt, for sale. Another Swan was shot on one of the small lakes near Highland Falls, on October 21, 1880.

**171. Chen hyperboreus,** *Pallas.* SNOW GOOSE. A large flock of Snow Geese settled upon the Hudson, near Cornwall, a year or two ago; they were too wild to allow the gunners to obtain a shot, although Mr. "Josh" Ward endeavored to shoot a specimen for me.

**172. Bernicla canadensis,** *Linné.* CANADA GOOSE. Abundant during migrations.

**173. Bernicla brenta,** *Pallas.* BRANT. Occurs during migrations. Mr. Stearns says (List of Birds In Vicinity of Fishkill-on-the-Hudson, N. Y., 1880) that it is "not rare" in fall, at Fishkill, on the Hudson.

**174. Anas boscas,** *Linné.* MALLARD. Found during spring and fall migrations.

**175. Anas obscura,** *Gmelin.* BLACK DUCK. A very abundant spring and fall migrant; less numerous in summer and winter; breeds.

The Black Duck, although often seen in immense beds on the Hudson River, is rather partial to small creeks, and inland ponds and pools. It commonly feeds upon the salt marshes beside the river. On land, its movements appear awkward, although it manages to waddle over the humpy meadows with considerable celerity. At such times a side view is very pleasing, although a posterior one is most ludicrous. Its tail wiggles incessantly, while its body performs a remarkable series of lateral oscillatory movements, especially when walking over tussocks of grass. When alarmed it stretches its neck to the full extent, and then squats amongst the hummocks, and remains motionless. It swims very rapidly, and rises from the water with great swiftness. When a flock of Dusky Ducks is about to alight, the birds circle around the intended spot, and then drop vertically down from a considerable height, making a loud splash as they strike the water.

*Dimensions.*—Average measurements of two adult males: length, 24·50; stretch, 38·50; wing, 11·00; tail, 4·35; culmen, 2·33; gape, 2·65 tarsus, 2·00; middle toe, 2·17; its claw, ·44.

**176. Chaulelasmus streperus,** *Linné.* GADWALL. A spring and fall migrant.

**177. Dafila acuta,** *Linné.* PINTAIL. Quite common during migrations.

**178. Mareca americana,** *Gmelin.* AMERICAN WIDGEON; BALDPATE. A common species during migrations.

*Dimensions.*—Measurements of No. 888, ♂ ad., Highland Falls, N. Y., March 12, 1876, E. A. M.: length, 20·25; stretch, 34·50; wing,

9·88; tail, 4·50; culmen, 1·38; gape, 1·60; tarsus, 1·45; hallex and its claw, ·52; middle toe and claw, 2·00.

**179. Spatula clypeata,** *Linné.* Shoveller; Spoonbill. Occurs during autumn, winter and spring.

*Dimensions.*—Measurements of adult male: length, 20·10; stretch, 32·00; wing, 9·42; tail, 3·65; culmen, 2·60; tarsus, 1·25.

**180. Querquedula discors,** *Linné.* Blue-Winged Teal. Abundant during migrations.

**181. Nettion carolinensis,** *Gmelin.* Green-Winged Teal. Abundant during migrations.

**182. Aix sponsa,** *Linné.* Wood Duck; Summer Duck. A summer resident; breeds.

*Dimensions.*—Average measurements of three specimens: length, 17·35; stretch, 29·00; wing, 8·44; tail, 4·50.

**183. Fulix marila,** *Linné.* Scaup Duck; Greater Blackhead. Very abundant during autumn, winter and spring.

*Dimensions.*—Measurements of No. 1,841, ♂ ad., Hudson River, at Cornwall, March 28, 1879, E. A. M.: length, 19·65; stretch, 33·75; wing, 8·80; tail, 2·85; culmen, 1·69; gape, 2·23; tarsus, 1·58; middle toe, 2·50; its claw, ·38.

**184. Fulix affinis,** *Eyton.* Little Blackhead. A common species during migrations, and in winter.

*Dimensions.*—Measurements of No. 543, ♂ ad., Highland Falls N. Y., December 6, 1873, E. A. M.: length, 16·10; stretch, 28·30; wing, 8·00; tail, 2·60; culmen, 1·61; bill from nostril, 1·12; gape, 2·03; tarsus, 1·45; middle toe and claw, 2·50.

**185. Fulix collaris,** *Donovan.* Ringnecked Blackhead. Occasional during migrations.

**186. Æthyia vallisneria,** *Wilson.* Canvas-back. Quite common in autumn, winter and spring.

*Dimensions.*—Average measurements of Nos. 1,341 and 1,342, ♂♂ ad. ad., Hudson River, at Cornwall, March 23, 1877, E. A. M.: length, 22·31; stretch, 34·92; wing, 9·19; tail, 2·59; culmen, 2·94; gape, 2 59; tarsus, 1·75; length from tip of bill to end of toes, 26·00.

**187. Æthyia americana,** *Eyton.* Redhead. Not as abundant as the preceding species, but sometimes plentiful in autumn. Some that were shot at Cornwall on October 23, 1877, were moulting, and in such bad plumage that they could not be preserved as specimens.

**188. Clangula glaucium americana,** *Bonaparte.* American Golden-eye. Very abundant in autumn, winter and spring.

The Golden-eyes are fond of keeping in mid-stream amongst the floating ice-cakes, skulking behind some larger mass whenever an attempt is made to get near them. As they take to flight, the loud, ringing whistle of their wings may be heard a long way off—a very

pleasant sound! As long as the smallest spot remains unfrozen, the "Whistlers" stay upon the Hudson; and I have seen them flying northward when the river was entirely closed above West Point.

*Dimensions.* — Measurements of No. 819 ♀, Highland Falls, N. Y., December 8, 1875, E. A. M.: length, 17·13; stretch, 29·00; wing, 7·81; tail, 3·00.

**189. Clangula albeola**, *Linné.* BUTTERBALL; BUFFLEHEAD. A very common winter resident. It occasionally frequents small inland ponds.

**190. Harelda glacialis,** *Linné.* OLD SQUAW; LONG-TAILED DUCK. A very abundant spring and fall migrant, and winter resident when the Hudson is not frozen.

When heard at a distance, the loud cackling notes of hundreds of Old Squaws, borne from afar on frosty winds, strike the ear most pleasantly, bearing sweet remembrances of happy days spent on blue billows, amid the whistling wings of gay water-fowl and the beauteous forms of sea-birds. When the water is rough, the Old Squaws are reluctant to take to flight, or, perhaps, are more gentle than at other times. As you approach, they become greatly disturbed, however, and some of the old males get so much excited that they are barely able to sit upon the water. The females commonly dive, coming to the surface at an increased distance from you. The males elevate their tails until they stick perpendicularly upward, and rapidly vibrate them, at the same time throwing their heads backward, and turning around so swiftly on the water as to seem at times fairly to spin like a top, and croak loudly all the time.

On the 3d of November, 1879, I made the following observation on the rapidity of the flight of the Long-tailed Duck:—just after leaving the Sing Sing depot, going south on the Hudson River Railroad, a small flock of Old Wives arose from the water and flew in a direct course down the Hudson. Their white colors were very distinctly visible, as seen against the deep blue of the river. I noticed that they maintained about the same relative position with regard to the train, which, however, had not yet gotten under full headway; but the Ducks changed their course at intervals, and at times they would rise in the air, separating from each other, and then descending swiftly to near the surface of the water; then, for a time, the impetus thus acquired would carry them onward at an accelerated speed. As our train got fairly under way, and, fortunately for my observation, the Ducks ceased to move indirectly, and skimmed along close to the water, keeping about in the middle of the river. It so happened that the regular rate of speed at which the train moved was exactly equal to the rate at which the Ducks flew; accordingly they kept their relative position opposite to us as long as our course lay along the river;

when the train slowed up, before turning back from the Hudson, at Spuyten Duyvil, the Ducks flew ahead. In order to get at the exact distance and time, I wrote to the General Superintendent of the railroad, who kindly sent the following reply: "Referring to yours of this date, relative to train, stops, and distances, Nov. 3, 1879: The train alluded to left Garrisons at 7.52 A. M., Sing Sing 8.30 and Spuyten Duyvil 8.58; and the distance between Sing Sing and Spuyten Duyvil is $19\frac{56}{100}$ miles." Signed, "J. M. Toucey, Gen'l Sup't." The time, then, was exactly 28 minutes, and the distance 19.56 miles; this makes their rate of flight 1 mile in 1.43 minutes, or rather more than a mile in a minute and a half.

*Dimensions.*—Average measurements of three adult males: length, 23·00; stretch, 31·00; wing, 8·75; tail, 8·75; culmen, 1·12; gape, 1·77; tarsus, 1·40; middle toe and claw, 2·20; middle toe alone, 1·95; claw, ·34.

**191. Œdemia americana,** *Swainson* and *Richardson.* American Scoter. Very abundant during migrations.

*Dimensions.* — Average measurements of three females: length, 18 24; stretch, 32·00; wing, 8·13; tail, 3·55; culmen, 1·63. Measurements of No. 796, ♂ ad., Hudson River, at Cornwall, October 9, 1875, E. A. M.: length, 20·50; stretch, 33·65; wing, 8·56; tail, 3·65.

**192. Melanetta velvetina,** *Cassin.* American Velvet Scoter. Very abundant during spring and fall migrations; occasionally seen in winter.

*Dimensions.* — Average measurements of four adult males: length, 22·50; stretch, 39·50; wing, 10·80; tail, 4·00; culmen, 1·55; gape, 2·78; tarsus, 2·00; middle toe and claw, 3·25; middle toe alone, 2·90; its claw, ·40. Average measurements of two adult females: length, 21·00; stretch, 37·50; wing, 10·10; tail, 3·45; culmen, 1·55; gape, 2·65: tarsus, 1·55; middle toe and claw, 3·20; middle toe alone, 2·80; its claw, ·42.

**193. Pelionetta perspicillata,** *Linné.* Surf Duck; Sea Coot. Abundant during spring and fall migrations. Arrives earlier than the Velvet Duck, in autumn.

*Dimensions.*—Average measurements of two adult males: length, 20·10; stretch, 34·00; wing, 9·15; tail, 3·10; culmen, 1·53; gape, 2·58; tarsus, 1·82; middle toe, 2·67; its claw, ·40; middle toe and claw, 3·00.

**194. Erismatura rubida,** *Wilson.* Ruddy Duck. An abundant spring and fall migrant. In autumn the Ruddys are very gentle, but expert divers.

*Dimensions.* — Average measurements of three females: length 14·55; stretch, 22·00; wing, 5·40; tail, 2·50; culmen, 1·60; gape, 1·80.

**195. Mergus merganser americanus,** *Cassin.* American Sheldrake. A common winter resident.

This beautiful bird, though less abundant than the Red-breasted Sheldrake, is still quite plentiful on the Hudson. It often sits on shore, sunning itself and preening its feathers, or exploring crevices along the rocky shore. It feeds principally on fishes, which it is very expert at catching. I have often found a species of flat-fish in its gullet.

*Dimensions.*—Measurements of two adult females: length, 24·15; stretch, 33·50; wing, 9·23; tail, 4·15; culmen, 1·92; tarsus, 1·90; middle toe and claw, 2 80; length from tip of bill to end of toes, 25·00. Measurements of No. 1,343, ♂ ad., Hudson River at Cornwall, March 23, 1877, E. A. M.: length, 26·65; stretch, 37·00; wing, 10·30; tail, 4·75; culmen, 2·73; gape, 2 75; tarsus, 1·92; middle toe and claw, 3·00; length from tip of bill to end of toes, 27·30.

**196. Mergus serrator,** *Linné.* Red-breasted Sheldrake. A very abundant spring and fall migrant, and winter resident.

*Dimensions.*—Average measurements of two *adult males:* length, 24·00; stretch, 35·00; wing, 9 40; tail, 4·20; culmen, 2·35; gape, 2·90; tarsus, 1·86; middle toe, 2·40; its claw, ·40. Average measurements of two *adult females:* length, 22·00; stretch, 33·00; wing, 9·05; tail, 3·75; culmen, 2·16; gape, 2·61; tarsus, 1·75; middle toe, 2·21; its claw, ·35.

**197. Lophodytes cucullatus,** *Linné.* Hooded Sheldrake. A common winter resident.

*Dimensions.*—Average measurements of two males: length, 18·38; stretch, 26·50; wing, 7·25; tail, 3·81.

## Family, LARIDÆ.

**198. Larus argentatus,** *Brünnich.* Herring Gull. Usually abundant upon the Hudson during autumn, winter and spring, save when the river is frozen. It breeds in the Adirondack mountains.

**199. Larus delawarensis,** *Ord.* Ring-billed Gull. Occasional in winter and spring.

**200. Larus atricilla,** *Linné.* Laughing Gull. I have seen a specimen, shot on the Hudson, at Cornwall, from a large flock; another shot at Cold Spring, on the Hudson. Both birds were taken in the spring. Another black-headed Gull was seen on the Hudson, near Constitution Island; it was so gentle that a boatman attempted to strike it with an oar, when it flew to a buoy and alighted.

**201. Larus philadelphiæ,** *Ord.* Bonaparte's Gull. A winter resident; abundant in autumn.

*Dimensions.*—Average measurements of numbers 1,515 and 1,516 ♂

♂ ad. ad., Hudson River at Cornwall, November 17, 1877, E. A. M.: length, 14·61; stretch, 33·33; wing, 10·18; tail, 4·30; culmen, 1·22; gape, 1·89; tarsus, 1·32; middle toe and claw, 1·44; hallex, ·18; claw, ·12.

**202. Sterna fluviatilis,** *Naum.* COMMON TERN; SEA SWALLOW. Only once observed,—on Nov. 15, 1874.

**203. Sterna fuliginosa,** *Gmelin.* SOOTY TERN. On September 14, 1878, I saw one of these beautiful birds near West Point, from the deck of a little steam yacht. It flew quite near, and I wished for a gun to secure so rare a prize. To my great delight, however, a beautiful specimen was presented to me by Miss Anna B. Warner. It was killed by flying against the boathouse on Constitution Island, on the day previous to that on which I saw my bird.

*Dimensions.*—Measurements of No. 1772, ♀ ad., Constitution Island, Hudson River, N. Y., September 13, 1878, E. A. M.: length, 17·50; stretch, 34·70; wing, 11·00; tail, 6·60.

**204. Hydrochelidon lariformis,** *Gmelin.* BLACK TERN. The late Frederick S. Osborn shot three of these Terns in the autumn of 1874, near Garrisons, on the Hudson. I have seen one of the specimens in his collection; he also informed me that they were shot from a flock of about fifty birds. Mr. Thomas W. Wilson saw two Terns which were supposed to be of this species, about September 11, 1879, near Cold Spring.

## Family, **PODICIPIDÆ.**

**205. Podiceps holbölli,** *Reinhardt.* AMERICAN RED-NECKED GREBE. Quite abundant, at times, in autumn, winter and spring.

*Dimensions.*—Average measurements of two males: length, 21·55; stretch, 34·58; wing, 7·30; length from tip of bill to end of toes, 26·75; culmen, 2·06; tarsus, 2·61; middle toe and claw, 3·00.

**206. Dytes auritus,** *Linné.* HORNED GREBE. A very common spring and fall migrant; occasional in winter.

*Dimensions.*—Average measurements of four adults: length, 14·30; stretch, 24·38; wing, 5·40; tail, 1·55; culmen, ·91; gape, 1·32; tarsus, 1·85; middle toe and claw, 2·00; middle toe alone, 1·70; its claw, ·31.

**207. Podilymbus podiceps,** *Linné.* PIED-BILL GREBE; DABCHICK. Abundant during migrations; occasional in summer; doubtless breeds.

*Dimensions.*—Average measurements of four specimens: length, 13·65; stretch, 22·60; wing, 4·95; tail, 1·55; culmen, ·86; bill from nostril, ·55; gape, 1·38; tarsus, 1·64; middle toe and claw, 2·30; middle toe alone, 2·00.

## Family, COLYMBIDÆ.

**208. Colymbus torquatus,** *Brünnich.* Loon; Great Northern Diver. A common spring and fall migrant. A few possibly remain during summer, and breed.

**209. Colymbus septentrionalis,** *Linné.* Red-throated Diver. The first specimen of this species taken on the Hudson, was procured by Peter de Nottbeck, Esq., on November 14, 1876, at Low Point, sixty-one miles from New York City.[1] Mr. Winfrid A. Stearns has since recorded another capture, in his "List of Birds in Vicinity of Fishkill-on-Hudson, N. Y.," page 15.

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**B.** List of the Families of Birds known to inhabit the Hudson Highlands, with the number of their representative species.

| | | SPECIES. | | | SPECIES. |
|---|---|---|---|---|---|
| 1 | Turdidæ | 7 | 20 | Caprimulgidæ | 2 |
| 2 | Saxicolidæ | 1 | 21 | Cypselidæ | 1 |
| 3 | Sylviidæ | 2 | 22 | Trochilidæ | 1 |
| 4 | Paridæ | 1 | 23 | Alcedinidæ | 1 |
| 5 | Sittidæ | 2 | 24 | Cuculidæ | 2 |
| 6 | Certhiidæ | 1 | 25 | Picidæ | 6 |
| 7 | Troglodytidæ | 3 | 26 | Strigidæ | 6 |
| 8 | Alaudidæ | 1 | 27 | Falconidæ | 14 |
| 9 | Motacillidæ | 1 | 28 | Columbidæ | 2 |
| 10 | Sylvicolidæ | 32 | 29 | Tetraonidæ | 1 |
| 11 | Tanagridæ | 1 | 30 | Perdicidæ | 1 |
| 12 | Hirundinidæ | 6 | 31 | Ardeidæ | 6 |
| 13 | Ampelidæ | 2 | 32 | Charadriidæ | 2 |
| 14 | Vireonidæ | 6 | 33 | Scolopacidæ | 7 |
| 15 | Laniidæ | 1 | 34 | Rallidæ | 5 |
| 16 | Fringillidæ | 26 | 35 | Anatidæ | 28 |
| 17 | Icteridæ | 8 | 36 | Laridæ | 7 |
| 18 | Corvidæ | 3 | 37 | Podicipitidæ | 3 |
| 19 | Tyrannidæ | 8 | 38 | Colymbidæ | 2 |

[1] See Bull. Nutt. Orn. Club, Vol. III, No. 3, p. 146, July, 1878.

C. Special Lists, giving, in tabular form, the permanent residents, summer and winter sojourners, and spring and fall migrants.[2]

(A.) Permanent Residents.

1 Turdus migratorius.
2 Sialia sialis.
3 Parus atricapillus.
4 Sitta carolinensis.
5 Ampelis cedrorum.
6 Carpodacus purpureus.
7 Astragalinus tristis.
8 Melospiza fasciata.
9 Passer domesticus.
10 Sturnella magna.
11 Corvus frugivorus.
12 Cyanocitta cristata.
13 Picus villosus.
14 Picus pubescens.
15 Melanerpes erythrocephalus.
16 Colaptes auratus.
17 Bubo virginianus.
18 Scops asio.
19 Asio americanus.
20 Strix nebulosa.
21 Circus hudsonius.
22 Accipiter fuscus.
23 Falco peregrinus nævius.
24 Tinnunculus sparverius.
25 Buteo borealis.
26 Buteo lineatus.
27 Buteo pennsylvanicus.
28 Haliæëtus leucocephalus.
29 Zenædura carolinensis.
30 Ectopistes migratoria.
31 Bonasa umbellus.
32 Ortyx virginiana.
33 Anas obscura.

(B.) Summer Residents.

1. *Species Known to Breed.*

1 Turdus migratorius.
2 Turdus mustelinus.
3 Turdus fuscescens.
4 Mimus carolinensis.
5 Harporhynchus rufus.
6 Sialia sialis.
7 Parus atricapillus.
8 Sitta carolinensis.
9 Troglodytes domesticus.
10 Telmatodytes palustris.
11 Mniotilta varia.
12 Parula americana.
13 Helmitherus vermivorus.
14 Helminthophaga pinus.
15 Helminthophaga chrysoptera.
16 Helminthophaga ruficapilla.
17 Dendrœca æstiva.
18 Dendrœca virens.
19 Dendrœca pennsylvanica.
20 Dendrœca discolor.
21 Siurus auricapillus.
22 Siurus motacilla.
23 Geothlypis trichas.
24 Icteria virens.
25 Myiodioctes mitratus.
26 Setophaga ruticilla.
27 Pyranga rubra.
28 Hirundo erythrogastra.
29 Tachycineta bicolor.
30 Petrochelidon lunifrons.
31 Cotyle riparia.
32 Stelgidopteryx serripennis.

[2] The plan of these tables is based upon Dr. C. Hart Merriam's excellent "Review of the Birds of Connecticut," and no pretence of originality is made.

33 Progne subis.
34 Ampelis cedrorum.
35 Vireo olivaceus.
36 Vireo gilvus.
37 Vireo flavifrons.
38 Vireo noveboracensis.
39 Carpodacus purpureus.
40 Astragalinus tristis.
41 Poœcetes gramineus.
42 Coturniculus passerinus.
43 Melospiza palustris.
44 Melospiza fasciata.
45 Spizella socialis.
46 Spizella pusilla.
47 Passer domesticus.
48 Zamelodia ludoviciana.
49 Passerina cyanea.
50 Pipilo erythrophthalmus.
51 Dolichonyx oryzivorus.
52 Molothrus ater.
53 Agelæus phœniceus.
54 Sturnella magna.
55 Icterus spurius.
56 Icterus galbula.
57 Corvus frugivorus.
58 Cyanocitta cristata.
59 Tyrannus carolinensis.
60 Myiarchus crinitus.
61 Sayornis fuscus.
62 Contopus virens.
63 Empidonax minimus.
64 Caprimulgus vociferus.
65 Chordeiles popetue.
66 Chætura pelagica.
67 Trochilus colubris.
68 Ceryle alcyon.
69 Coccyzus erythrophthalmus.
70 Coccyzus americanus.
71 Picus villosus.
72 Picus pubescens.
73 Colaptes auratus.
74 Bubo virginianus.
75 Scops asio.
76 Asio americanus.
77 Strix nebulosa.
78 Circus hudsonius.
79 Accipiter fuscus.
80 Accipiter cooperi.
81 Falco peregrinus nævius.
82 Tinnunculus sparverius.
83 Buteo borealis.
84 Buteo lineatus.
85 Buteo pennsylvanicus.
86 Haliæëtus leucocephalus.
87 Ectopistes migratorias.
88 Zenædura carolinensis.
89 Bonasa umbellus.
90 Ortyx virginianus.
91 Philohela minor.
92 Tringoides macularius.
93 Butorides virescens.
94 Nyctiardea grisea nævia.
95 Rallus virginianus.
96 Porzana carolina.
97 Anas obscura.
98 Aix sponsa.
99 Podilymbus podiceps.

2. *Species occurring in summer, not known to breed.*

1 Sitta canadensis.
2 Certhia familiaris.
3 Dendrœca pinus.
4 Passerculus savanna.
5 Quiscalus purpureus.
6 Empidonax pusillus trailli.
7 Centurus carolinus.
8 Melanerpes erythrocephalus.
9 Pandion haliaëtus carolinensis.
10 Ardea herodias.
11 Herodias alba egretta.
12 Rhyacophilus solitarius.
13 Gallinula galeata.

## (C.) Winter Residents and Visitors.

*(Permanent residents are included.)*

1 Turdus migratorius.
2 Turdus pallasi.
3 Sialia sialis.
4 Regulus satrapa.
5 Parus atricapillus.
6 Sitta carolinensis.
7 Sitta canadensis.
8 Certhia familiaris.
9 Anorthura troglodytes hyemalis.
10 Dendrœca coronata.
11 Ampelis garrulus.
12 Ampelis cedrorum.
13 Lanius borealis.
14 Pinicola enucleatór canadensis.
15 Carpodacus purpureus.
16 Loxia leucoptera.
17 Loxia curvirostra americana.
18 Ægiothus linaria.
19 Chrysomitris pinus.
20 Astragalinus tristis.
21 Plectrophanes nivalis.
22 Melospiza fasciata.
23 Junco hyemalis.
24 Spizella montana.
25 Passer domesticus.
26 Sturnella magna.
27 Corvus frugivorus.
28 Cyanocitta cristata.
29 Picus villosus.
30 Picus pubescens.
31 Sphyrapicus varius.
32 Melanerpes erythrocephalus.
33 Colaptes auratus.
34 Bubo virginianus.
35 Scops asio.
36 Asio americanus.
37 Strix nebulosa.
38 Nyctea scandiaca.
39 Circus hudsonius.
40 Accipiter fuscus.
41 Astur atricapillus.
42 Falco peregrinus nævius.
43 Æsalon columbarius.
44 Tynnunculus sparverius.
45 Buteo borealis.
46 Buteo lineatus.
47 Buteo pennsylvanicus.
48 Archibuteo lagopus sanctijohannis.
49 Aquila chrysaëtus canadensis.
50 Haliæëtus leucocephalus.
51 Ectopistes migratoria.
52 Zenædura carolinensis.
53 Bonasa umbellus.
54 Ortyx virginiana.
55 Ardea herodias (Dec. 12, 1880.)
56 Anas obscura.
57 Spatula clypeata.
58 Fulix marila.
59 Fulix affinis.
60 Æthyia vallisneria.
61 Clangula glaucium americana.
62 Clangula albeola.
63 Harelda glacialis.
64 Melanetta velvetina.
65 Mergus merganser americanus.
66 Mergus serrator.
67 Lophodytes cucullatus.
68 Larus argentatus.
69 Larus delawarensis.
70 Larus philadelphiæ.
71 Podiceps holbölli.
72 Dytes auritus.
73 Colymbus torquatus.

## (D.) Migrants not known to breed.

*(Some of these winter.)*

1 Turdus pallasi.
2 Turdus swainsoni.
3 Turdus swainsoni aliciæ.
4 Regulus calendula.
5 Regulus satrapa.
6 Sitta canadensis.
7 Anorthura troglodytes hyemalis.
8 Eremophila alpestris.
9 Anthus ludovicianus.
10 Helminthophaga celata.
11 Helminthophaga peregrina.
12 Dendrœca cærulescens.
13 Dendrœca cœrulea.
14 Dendrœca coronata.
15 Dendrœca blackburniæ.
16 Dendrœca striata.
17 Dendrœca castanea.
18 Dendrœca maculosa.
19 Dendrœca tigrina.
20 Dendrœca palmarum.
21 Siurus nævius.
22 Geothlypis philadelphia.
23 Myiodioctes canadensis.
24 Myiodioctes pusillus.
25 Vireo philadelphicus.
26 Vireo solitarius.
27 Ammodramus caudacutus.
28 Junco hyemalis.
29 Spizella montana.
30 Zonotrichia albicollis.
31 Zonotrichia leucophrys.
32 Passerella iliaca.
33 Scolecophagus ferrugineus.
34 Contopus borealis.
35 Empidonax pusillus trailli.
36 Empidonax flaviventris.
37 Sphyrapicus varius.
38 Asio accipitrinus.
39 Astur atricapillus.
40 Æsalon columbarius.
41 Archibuteo lagopus sanctijohannis.
42 Aquila chrysaëtus canadensis.
43 Botaurus lentiginosus.
44 Ardetta exilis.
45 Charadrius dominicus.
46 Oxyechus vociferus.
47 Gallinago media wilsoni.
48 Ereunetes pusillus.
49 Totanus melanoleucus.
50 Totanus flavipes.
51 Rhyacophilus solitarius.
52 Rallus longirostris crepitans.
53 Fulica americana.
54 Olor americanus.
55 Chen hyperboreus.
56 Bernicla canadensis.
57 Bernicla brenta.
58 Anas boscas.
59 Chaulelasmus streperus.
60 Dafila acuta.
61 Mareca americana.
62 Spatula clypeata.
63 Querquedula discors.
64 Nettion carolinensis.
65 Fulix marila.
66 Fulix affinis.
67 Fulix collaris.
68 Æthyia vallisneria.
69 Æthyia americana.
70 Clangula glaucium americana.
71 Clangula albeola.
72 Harelda glacialis.
73 Œdemia americana.
74 Melanetta velvetina.
75 Pelionetta perspicillata.
76 Erismatura rubida.

77 Mergus merganser americanus.
78 Mergus serrator.
79 Lophodytes cucullatus.
80 Larus argentatus.
81 Larus delawarensis.
82 Larus atricilla.
83 Larus philadelphiæ.
84 Sterna fluviatilis.
85 Sterna fuliginosa.
86 Hydrochelidon lariformis.
87 Podiceps holbölli.
88 Dytes auritus.
89 Colymbus torquatus.
90 Colymbus septentrionalis.

[ To be continued ]

## Annual Meeting, Monday, May 16, 1881.

The annual meeting this evening at 7.30 o'clock. The President in the chair. Records of the last annual meeting read.

The reports of the Secretary, Treasurer, Auditor, Librarian, and the Curators and Committees were read and duly accepted, and ordered to be placed upon file.

Mr. Robert S. Rantoul read memoirs of the late Hon. James Kimball, of Salem, an associate member, for several years the curator of history, and of the late Prof. Benjamin Peirce of Harvard University, Cambridge, a corresponding member. Referred to the Publication Committee.

Mr. T. F. Hunt, chairman of the committee on nominations reported the following list of officers, which was duly elected; Mr. Israel and the Secretary having been requested to collect, assort, and count the votes.

PRESIDENT:

HENRY WHEATLAND.

VICE-PRESIDENTS:

ABNER C. GOODELL, JR. — WILLIAM SUTTON.
FREDERICK W. PUTNAM. — DANIEL B. HAGAR.

SECRETARY: GEORGE M. WHIPPLE.

TREASURER: GEORGE D. PHIPPEN.

AUDITOR: RICHARD C. MANNING.

LIBRARIAN: WILLIAM P. UPHAM.

CURATORS:

*History*—HENRY F. WATERS.
*Manuscripts*—WILLIAM P. UPHAM.
*Archæology*—FREDERICK W. PUTNAM.
*Numismatics*—MATTHEW A. STICKNEY.
*Geology*—ISAAC J. OSBUN.
*Botany*—GEORGE D. PHIPPEN.
*Zoology*—EDWARD S. MORSE.
*Horticulture*—JOHN E. PEABODY.
*Music*—JOSHUA PHIPPEN, JR.
*Painting & Sculpture*—T. F. HUNT.
*Technology*—EDWIN C. BOLLES.

COMMITTEES:

*Finance:*

The PRESIDENT, *Chairman ex off.*

JAS. O. SAFFORD. HENRY M. BROOKS. GEO. R. EMMERTON.

The TREASURER, *ex off.*

*Library:*

CHARLES W. PALFRAY. GEORGE F. FLINT. HENRY F. KING.
WILLIAM NEILSON. WILLIAM D. NORTHEND.

The LIBRARIAN, *ex off.*

*Publication:*

EDWARD S. ATWOOD. ABNER C. GOODELL, JR. EDWIN C. BOLLES.
H. F. WATERS. T. F. HUNT.
JAMES A. EMMERTON.

*Lecture:*

FREDERICK W. PUTNAM. AMOS H. JOHNSON. ARTHUR L. HUNTINGTON.
FIELDER ISRAEL. ROBERT S. RANTOUL.

*Field Meeting:*

The SECRETARY, *Chairman ex off.*

GEORGE A. PERKINS, Salem. GEORGE D. PHIPPEN, Salem.
GEORGE COGSWELL, Bradford. F. R. KIMBALL, Salem.
FRANCIS H. APPLETON, Peabody. EBEN N. WALTON, Salem.
NATHANIEL A. HORTON, Salem. WINFIELD S. NEVINS, Salem.
EDWARD S. MORSE, Salem.

## THE RETROSPECT OF THE YEAR

compiled from the several reports read at the meeting, and the remarks of several members in relation thereto, presents the work of the Institute in the various departments since the last annual meeting.

MEMBERS.—Changes occur in the list of our associates by the addition of new names and the withdrawal of some by resignation, removal from the county or vicinity, or by death. We have received information of the decease of eleven members during the year.

CALEB COOKE, son of William and Mary (Fogg) Cooke, was born in Salem Feb. 5, 1836, naturalist; died at Salem, June 5, 1880. Elected a member May 11, 1853.

PORTEUS P. BIELBY, son of John and Martha (Liddle) Bielby, born at Little Falls, N. Y., physician; died at Salem, Aug. 1, 1880, aged 34 years, 5 mos. Elected a member February 5, 1877.

CHARLES H. FLINT, son of Simeon and Ellen (Pollard) Flint, born at Salem, drain-pipe dealer; died at Salem, Oct. 3, 1880, aged 34 yrs., 4 mos., 3 days. Elected a member, June 4, 1877.

BENJAMIN PEIRCE, son of Benjamin and Lydia (Nichols) Peirce born at Salem, April 4, 1809; graduated at Harvard College, 1829,—Perkins Professor of Astronomy and Mathematics at Harvard; died at Cambridge, Oct. 6, 1880. Elected a corresponding member, January 13, 1864.

WILLIAM F. NICHOLS, son of Ichabod and Cassandra (Frye) Nichols, born at Salem, April 4, 1801, currier;

died at Salem, Oct. 29, 1880, aged 79 yrs., 6 mos., 25 days. Elected a member, Sept. 27, 1854.

Francis Brown, son of Ammi and Hannah (Baker) Brown, born at Salem, Aug. 5, 1815, treasurer of Salem Lead Company; died at Salem, Nov. 16, 1880. Aged 65 yrs., 3 mos., 11 days. Elected a member Sept. 21, 1853.

James Kimball, son of James and Catherine (Russell) Kimball, born at Salem, October 14, 1808, for many years one of the County Commissioners of Essex; died at Salem, Nov. 29, 1880, aged 72 yrs., 1 mo., 15 days. An original member.

William S. Hutchinson, son of Thomas J. and Mary E. (Skinner) Hutchinson, born at Salem, March 14, 1853, printer; died at Salem, Dec. 24, 1880, aged, 27 years, 9 mos., 10 days. Elected a member, March 20, 1876.

Nathaniel C. Robbins, son of David and Elizabeth (Burrill) Robbins, born at Salem, April 19, 1810, merchant; died at Salem, January 6, 1881, aged 70 years, 7 mos., 18 days. Elected a member, June 18, 1856.

George H. Peirson, son of Thomas and Celia (Peirson) Honeycomb, born at Salem, June 16, 1816, postmaster of Salem; died at Salem, Feb. 8, 1881, aged 64 years, 7 mos., 23 days. Elected a member, Apr. 5, 1869.

George C. Chase, son of Henry and Betsey (Abbott) Chase, born at Salem, May 2, 1807, agent of Forest River Lead Company, Salem; died at Salem, May 14, 1881. Elected a member, Feb. 8, 1854.

Field Meetings.—During the year, five. *First*, at Salem Neck, June 22, 1880; the 250th anniversary of the arrival of John Winthrop at Salem. The meeting was largely attended. An admirable address was delivered

by Robert S. Rantoul, Esq.; an original poem by Miss Lucy Larcom was read by Rev. DeWitt S. Clarke, and remarks were made by Col. T. W. Higginson, of Cambridge, Hon. George W. Warren, of Boston, Hon. George B. Loring, M. C., Hon. Henry K. Oliver, mayor of Salem, Mr. Seth Low of New York. Letters were read by Rev. E. S. Atwood from John G. Whittier, Hon. R. C. Winthrop, Pres. of Mass. Hist. Soc., Dr. Andrew P. Peabody of Harv. Univ., His Exc. John D. Long, Col. L. Saltonstall of Newton, Hon. Charles L. Woodbury of Boston, and Hon. Marshall P. Wilder, Pres. N. E. Hist. Gen. Soc. Rev. George H. Hosmer read a communication prepared by Stanley Waters, relating to Rev. Dr. Wm. Bentley, on whose birthday the meeting occurred. The address, poems, letters, remarks, etc., have been printed in the Hist. Coll. of the Institute, vol. xvii.

*Second Meeting.*— Was held July 30, 1880, at Riverside Farm in Bradford, the residence of Dr. George Cogswell, an associate member. The day was pleasant and a large number were in attendance. By invitation, the Farmers' and Mechanics' Association of Haverhill and Bradford participated in the exercises of this occasion. The lunch was spread in a pine grove on the shores of the Merrimack, and the afternoon session was held at 2 P. M., the following taking part in the meeting: The President, Dr. George Cogswell, Rev. Mr. Kingsbury of Bradford, Prof. E. S. Morse of Salem, Mr. Tewksbury of Bradford, Prof. Hall of the university of Minnesota, Mr. Fish of the Salem Summer School, Mr. John W. Perkins of the Salem High School, and Mr. Emery of Lawrence.

*Third meeting.*— At Lowell Island, Salem Harbor, August 12, 1880. The President, Prof. E. S. Morse, of Salem, Rev. S. D. Gammell, of Boxford, Mr. H. Saze of the Summer School, Dr. G. A. Perkins, of Salem, Rev.

Jos. Banvard of Neponset, and N. A. Horton, Esq., of the Salem Gazette, took part in the exercises of the afternoon session. The Institute is again under obligations to Mr. Rantoul for his interesting account of Cat (now Lowell) Island which has been appended to the report of this meeting in the Bulletin of the Institute.

*Fourth meeting.*— On Friday and Saturday at the Wentworth House, New Castle, N. H. At the session, Friday evening, Vice-President F. W. Putnam spoke on the Pueblo Indians of New Mexico—on Saturday the party visited many places of interest in the vicinity, making an extended call at the old and celebrated Mansion of Gov. Benning Wentworth, on the return trip, in carriages, to the cars.

*Fifth Meeting.*— Was held in midwinter January 11, 1881, at the Ponds in Essex and Hamilton; thither the party was conveyed in large sleighs. After a ramble about the shores of the ponds and in the woods, and dinner at Whipple's, the afternoon session was held; Messrs. F. W. Putnam, C. C. Abbott, E. S. Morse and E. S. Atwood were the speakers, and an interesting paper on the condition of trees in winter was read by Mr. John Robinson.

Excursions.— *First*, a summer excursion to the Glen House, one of the leading White Mountain hotels. Among the natural attractions in this vicinity are Tuckerman's Ravine, Crystal Cascade, Glen Ellis Falls, the ascent to the summit of Mt. Washington by carriages, and a stage ride from the Glen Station of fourteen miles to the hotel. Left Salem Tuesday morning July 13, 1880 and returned on Thursday evening July 15.

*The Second.*— To Ausable Chasm, Lake Champlain, River St. Lawrence, Thousand Isles, Montreal, Dixville

Notch, etc. Left Salem Thursday, Aug. 19, 1880, and returned Aug. 24. *Third.*—To Washington (all rail route), left Salem Friday Feb. 11, 1881, return Friday Feb. 18.

LECTURES.—A course of eight lectures, under the direction of the lecture committee, was as follows: 1st, Monday, Oct. 18, 1880, Miss Alice C. Fletcher, "Passion Play of Ober-ammergau." *Extra*—Thursday, Nov. 4, 1880, Prof. W. Boyd Dawkins, of the Victoria University, Manchester, England, "The men of the Caverns." 2nd, Monday, Nov. 8, 1880, Mrs. Abby Sage Richardson, "English Ballads." 3rd, Monday, Nov. 29, 1880, Rev. Charles T. Brooks, of Newport, R. I., "Curiosities of Language." 4th, Monday, Dec. 20, 1880, Prof. William H. Niles of Cambridge, "Holland and its People." 5th, Monday, Jan. 24, 1881, Frederick E. Ober of Beverly, "Florida." 6th, Monday, Jan. 31, 1881, Rev. James F. Clarke of Boston, "Nooks and corners of English literature." 7th, Thursday, Mar. 24, 1881, Rev. E. C. Bolles of Salem, "Historic places of early England."

In addition to the above, three courses of lectures delivered in the afternoon, free to the public; the only condition was that persons desiring to attend should apply for tickets at the rooms of the Institute. The results have been most gratifying. These lectures were provided by the liberality of the Curator of painting and sculpture. *First course* by J. Walter Fewkes, Ph. D., of Cambridge: four lectures upon "Forms of animal life," Wednesdays, Nov. 3, 10, 17, 24, 1880. *Second course*, five lectures upon art subjects: Wednesday, Dec. 15, S. R. Roehler, "A practical talk on Etching;" Wednesday, Dec. 22, S. G. W. Benjamin, "The art of design;" Wednesday, Dec. 29, by E. S. Morse, "Methods of Illustration;" Wednes-

day, Jan. 5, 1881, G. P. Lathrop of Boston, "Color in Nature;" Wednesday, Jan. 12, G. P. Lathrop, "Color in art and life."

*Third course* by Prof. Isaac J. Osbun of the State Normal School, Salem, on "The Chemistry of common Things:" Feb. 2, "A lump of Salt;" Feb. 9, "A pound of Sugar;" Feb. 16, "A loaf of Bread;" Feb. 23, "A cup of Tea."

Meetings.—Regular meetings usually on the first and third Monday evenings of each month. The following communications received and lectures delivered may be specified: John Robinson, "Notes on the Flora of Essex County, with sketches of the early botanists and a list of the publications on this subject." Edgar A. Mearns, "A continuation of a list of the birds of the Hudson Highlands, with annotations." Edward S. Morse, "The gradual dispersion of certain mollusks in New England."

William P. Andrews, "A tribute to the memory of Jones Very;" E. A. Silsbee on "Jones Very's place in Literature;" Charles E. Endicott on "China;" James F. Almy, "Notes on European travels;" Amos Noyes of Newburyport, "On the French Republic;" J. P. Cowles, Jr., of Ipswich, "In and about Pekin;" George Frederick Wright of Andover, "On the Glaciation of North America, and its bearing on the antiquity of man in New Jersey;" Isaac J. Osbun, Normal School, Salem, "Science teaching in schools," illustrated by experiments; Edward S. Morse, "A descriptive account of his apparatus for the utilization of the sun's rays in the ventilation of buildings," etc.; James A. Emmerton, "An account of Henry Silsbee and some of his descendants;" Mrs. K. T. Woods, "A memoir of Lewis N. Tappan of Manchester, Mass.;" Henry F. Waters, "Matthias Cor-

win of Southold, L. I., his parentage and relationship to George Corwin of Salem."

A Social Meeting. Monday, Jan. 3, 1881. The hall was well filled, the fine illustrated books from the art and centennial departments were placed on the tables for inspection, and there was some good and pleasing music of fine voices, Miss Kehew, Mrs. Washburn, Messrs. Chadwick, Macpherson, Cate and Clarke taking part; Messrs. Morse, Hagar, and Clarke spoke in a familiar manner, Dr. G. A. Perkins entertained some of the many guests by his microscope.

Concerts.—Under the personal direction of the curator of Music, four concerts have been given with much credit to the Society as musical performances. The twelfth season: 1st, Monday, Nov. 15, 1880, by Lilian Bailey and Mr. John A. Preston; 2d, Monday, Nov. 22, Miss A. L. Gage, Mrs. Jennie M. Noyes, Mr. Geo. W. Want, Mr. C. E. Hay; 3d, Monday, Dec. 6, by B. J. Lang, Pianoforte, Charles N. Allen and Gustav Dannreuther, violins, Henry Heindl, viola, Wulf Fries, violoncello, Miss Grace F. Dalton; 4th, Monday Jan. 10, 1881, by Miss E. W. Archer, Miss H. A. Brooks, Miss G. E. Machado, Mr. C. A. Clark, Mr. J. Phippen, Jr., pianist, Dr. S. C. Bullard, baritone. Monday, Jan. 28, 1881, a Piano recital by Joshua Phippen, Jr., assisted by Miss Ita Welsh.

Publications have been issued as heretofore,—the Bulletin, vol. xii, and the Historical Collections, vol. xvii. The exchange list, with few exceptions, continues about the same as last year. In the opinion of persons competent to judge they are becoming more and more valuable, and this estimate seems to be strengthened by the fact that historical societies and libraries are anxious to

procure them and there is an increasing demand from individuals and the book-trade.

LIBRARY. — The additions to the Library for the year (May, 1880 to May, 1881) have been as follows.

*By Donation.*

| | |
|---|---|
| Folios, | 10 |
| Quartos, | 178 |
| Octavos, | 506 |
| Duodecimos, | 280 |
| Sexdecimos, | 222 |
| Octodecimos, | 18 |
| Total of bound volumes, | 1214 |
| Pamphlets and serials, | 6171 |
| Total of donations, | 7385 |

*By Exchange.*

| | |
|---|---|
| Folios, | 1 |
| Quartos, | 15 |
| Octavos, | 52 |
| Duodecimos, | 3 |
| Sexdecimos, | 2 |
| Total of bound volumes, | 73 |
| Pamphlets and serials, | 1238 |
| Total of exchanges, | 1311 |

*By Purchase.*

| | |
|---|---|
| Quartos, | 3 |
| Octavos, | 41 |
| Duodecimos, | 10 |
| Sexdecimos, | 3 |
| Total of bound volumes, | 57 |
| Pamphlets and serials, | 39 |
| Total of purchases, | 96 |
| Total of donations, | 7385 |
| Total of exchanges, | 1311 |
| Total by purchase, | 96 |
| Total of additions, | 8792 |

Of the total number of pamphlets and serials, 3,362 were pamphlets, and 4,086 were serials.

The donations to the Library for the year have been received from one hundred and sixty-five individuals and forty-six societies and departments of the General and State

governments. The exchanges from seven individuals, one hundred and fourteen societies and incorporate institutions of which sixty-four are foreign; also from editors and publishers.

The annual examination of the Library has been made. Twelve volumes are missing from their places.

Donations or exchanges have been received from the following:—

| | Vols. | Pam. |
|---|---|---|
| Abbott, Francis E., Cambridge, Mass., | 1 | |
| Abbott, Dr. Charles C., Trenton, N. J., | 1 | 3 |
| Adams, Prof. H. B., Amherst, Mass., | | 2 |
| Adelaide, Philosophical Society, | | 1 |
| Almy, James F., | 1 | |
| Alnwick, Bernwickshire Naturalists' Field Club, | | 1 |
| Altenburg, Naturforschende Gesellschaft des Osterlandes | | 1 |
| American Association Advancement of Science, | 1 | 1 |
| American Social Science Association, | | 1 |
| Amiens, Société Linnéenne du Nord de la France, | 6 | 4 |
| Anagnos, M., So. Boston, Mass., | | 1 |
| Andrews, Mrs. James H., | | 1 |
| Andrews, William P., | | 52 |
| Appleton, W. S., Boston, Mass., | | 2 |
| Archer, A. J., | | 1 |
| Atkinson, William P., | 1 | |
| Atwood, Rev. E. S., | | 70 |
| Baker, W. S., Philadelphia, Pa., | 1 | |
| Baltimore, Maryland Historical Society | | 1 |
| Baltimore, Md., Peabody Institute, | | 1 |
| Bancroft, C. F. P., Andover, Mass., | | 2 |
| Barenson, A. Frank, | | 1 |
| Barlow, Mrs. John, | 19 | 11 |
| Barton, Gardner, | 10 | 98 |
| Barton, William G., Newspapers, | 2 | 14 |
| Bassett, Samuel, Chelsea, Mass., | 1 | 3 |
| Batchelder, Henry M., | 1 | |
| Beadle, Capt. William, | | 4 |
| Belfast, Naturalists' Field Club, | | 1 |
| Berkshire Life Insurance Company | 1 | |
| Berlin, Gesellschaft Naturforschender Freunde, | | 1 |
| Berlin, Zeitschrift für die gesammten Naturwissenschaften, | 1 | |
| Bern, Naturforschende Gesellschaft, | 2 | |
| Bolles, Rev. E. C., | 11 | 196 |

| | Vols. | Pam. |
|---|---|---|
| Bologna, Accademia delle Scienze, | | 1 |
| Bonn, Naturhistorischer Verein der preussischen Rheinlande und Westphalens, | 2 | |
| Bordeaux, Société Linnéenne, | | 5 |
| Boston, American Academy of Arts and Sciences, | | 5 |
| Boston Athenæum, | 1 | |
| Boston, City of, | 5 | |
| Boston, City Hospital, Trustees of, | 1 | |
| Boston, Mass. General Hospital, | | 1 |
| Boston, Mass. Historical Society, | 1 | |
| Boston, Mass. Horticultural Society, | | 2 |
| Boston, Mass. Institute of Technology, | | 2 |
| Boston, Mass. Medical Society, | | 1 |
| Boston, Public Library, | | 5 |
| Boston, Scientific Society, | | 5 |
| Boston, Society of Natural History, | 1 | 5 |
| Boston, State Library of Massachusetts, | 11 | 5 |
| Boston, N. E. Historic Genealogical Society, | 1 | 8 |
| Bradlee, Rev. C. D., Boston, Mass., | | 1 |
| Braunschweig, Archiv für Anthropologie, | 3 | |
| Braunschweig, Verein für Naturwissenschaft, | | 1 |
| Bremen, Naturwissenschaftlicher Verein, | | 3 |
| Brinley, Francis, Newport, R. I., | | 1 |
| Bristol, Naturalists' Society, | | 1 |
| Brock, R. A., Richmond, Va., Newspapers, | 4 | 1 |
| Brockway, Miss Adelaide M., Newburyport, Mass., | 11 | 1 |
| Brooklyn, New England Society, | | 1 |
| Brooks, Henry M., | 5 | 160 |
| Brooks, Miss E. M. R., | | 42 |
| Brünn, Naturforschender Verein, | 1 | |
| Brunswick, Me., Bowdoin College Library, | | 1 |
| Bruxelles, Société Belge de Microscopie, | 1 | 18 |
| Bruxelles, Société Entomologique de Belgique, | 1 | 7 |
| Bruxelles, Société Malacologique de Belgique, | 1 | 8 |
| Buckhurst Hill, Epping Forest and County of Essex Naturalists' Field Club, | | 5 |
| Buffalo, Society of Natural Sciences, | | 1 |
| Buffalo, Young Men's Association, | | 1 |
| Bunker Hill Monument Association, | | 1 |
| Burnham, J. H., Bloomington, Ill., | 30 | 24 |
| Buttrick, S. B., | | 1 |
| Cable, H. M., Boston, Mass., | 2 | |
| Calcutta, Geological Survey, | 1 | |
| Caller, J. M., | 5 | 1 |

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|---|---|---|
| Cambridge, Harvard University Library, | | 11 |
| Cambridge, Museum of Comparative Zoölogy, | 1 | 10 |
| Cambridge, Nuttall Ornithological Club, | | 4 |
| Carpenter, Rev. C. C., Mount Vernon, N. H., | 5 | 28 |
| Case, L. B., Richmond, Ind., | | 3 |
| Case, Theo. S., Kansas City, Mo., | | 1 |
| Chadwick, Jas. R., Boston, Mass., | | 2 |
| Chadwick, Harrison E., Bradford, Mass., | | 1 |
| Chamberlain, Samuel, | 1 | |
| Chandler, Gardner L., | 57 | 7 |
| Cheever, A. W., Sheldonville, Mass., | | 53 |
| Chicago, Historical Society, | | 2 |
| Chicago, Illinois Association Sons of Vermont, | | 1 |
| Choate, Mrs. George F., | 42 | |
| Cincinnati, Public Library, | 2 | |
| Cody, P. J., Peabody, Mass., Newspapers. | | |
| Cole, Miss C. J., | | 2 |
| Cole, Mrs. N. D., Newspapers. | | 18 |
| Collett, Prof. John, Indianapolis, Ind., | 1 | |
| Columbia, Missouri State University, | | 1 |
| Cooke, Caleb, Estate of the late, | 47 | 216 |
| Copenhague, Académie Royale, | | 1 |
| Copenhague, Société Royale des Antiquaries du Nord, | | 3 |
| Crosby, Mrs. M. K., | 9 | 133 |
| Crosby, Nathan, Lowell, Mass., | | 1 |
| Cutter, Abram E., Charlestown, Mass., | | 1 |
| Dana, Rev. M. McG., St. Paul, Minn., | | 3 |
| Danzig, Naturforschende Gesellschaft, | 2 | |
| Darmstadt, Verein für Erdkunde, | | 1 |
| Davenport, Academy of Natural Sciences, | | 2 |
| Deblois, T. M., St. John, N. B. | 1 | |
| De Borre, Alf. Preudhomme, | | 1 |
| Devereux, John James, Estate of the late, | 1 | |
| Doolittle, Miss E., Troy, N. Y., | | 1 |
| Dorchester, First Church, | | 1 |
| Dresden, Naturwissenschaftliche Gesellschaft "Isis" | | 3 |
| Dresden, Verein für Erdkunde, | | 3 |
| Dublin, Royal Irish Academy, | 3 | 2 |
| Dublin, Royal Society, | | 24 |
| Dudley, Rev. M. S., Cromwell, Conn., | | 1 |
| Emden, Naturforschende Gesellschaft, | | 1 |
| Erfurt, Konigl, Akademie Gemeinnütziger Wissenschaften, | | 1 |
| | | 1 |
| Essex Agricultural Society, | | 2 |

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|---|---|---|
| Eustis, Prof. H. L., Cambridge, Mass., | | 1 |
| Fall River, Public Library, | | 1 |
| Farrier, George H., Jersey City, N. J., | | 1 |
| Fewkes, J. Walter, Cambridge, Mass., | | 7 |
| Flanders, Rev. G. T., Lowell, Mass., | | 3 |
| Flint, Mrs. Simeon, Newspapers, | 28 | 127 |
| Folsam, A. A., Boston, Mass., | | 1 |
| Foote and Horton, Newspapers. | | |
| Frankfurt, Zoologische Gesellschaft, | | 5 |
| Gerard, James W., New York, N. Y., | | 1 |
| Giessen, Oberhessische Gesellschaft für Natur und Heilkunde, | | 1 |
| Gillis, James A., | | 193 |
| Goodell, A. C. jr., Newspapers, | | 1 |
| Green, Samuel A., Boston, Mass., | 50 | 274 |
| Green, Samuel S., Worcester, Mass., | | 2 |
| Groton, Town of, | | 2 |
| Hagar, D. B., | | 2 |
| Hale, Rev. E. E., Boston, Mass., | | 277 |
| Halifax, Nova Scotian Institute of Natural Science, | | 1 |
| Hall, Prof. E. W., Waterville, Me., | | 2 |
| Hamburg, Naturwissenschaftlicher Verein, | | 2 |
| Harlem, Société Hollandaise des Sciences, | | 3 |
| Harris, Mrs. George O., | | 91 |
| Hart, Charles Henry, Philadelphia, Penn., | | 2 |
| Henry, James, Trustees of the late, | | 1 |
| Higbee, Charles H., Boston, Mass., | 1 | 8 |
| Hobart Town, Royal Society of Tasmania, | 1 | |
| Hodges, Osgood, Estate of the late, | 63 | 142 |
| Holmes, John C., Detroit, Michigan, | 1 | 1 |
| Horton, N. A., | | 60 |
| Hunnewell, James F., Boston, Mass., | 1 | 6 |
| Hunt, T. F., | 36 | 130 |
| Ill. State Agricultural Society, | | 2 |
| Ill. State Board of Agriculture, | 1 | |
| Israel, Rev. Fielder, Newspapers, | 11 | 43 |
| Ives, Henry P., | | 7 |
| J., C. T. | | 1 |
| James, Davis L., | | 1 |
| James, Joseph F., | | 2 |
| Jenison, O. A., Lansing, Michigan, | 1 | 3 |
| Jewett, Rev. George B., | 4 | |
| Kato, H., Tokio, Japan, | 1 | |
| Kimball, James, Newspapers, | | 18 |
| Kimball, Mrs. James, Newspapers, | | 108 |

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| King, Henry F., . . . . . Newspapers, | 101 | 261 |
| Kittredge, Miss H. A , No. Andover, Mass., . . | 1 | |
| Kittredge, Miss Mary H., . . . . . | 17 | 43 |
| Kittredge, Misses, No. Andover, Mass., . . . | 14 | |
| Kjöbenhavn. Kongelige Danibee Videnskabernes Selskab, | | 1 |
| Königsburg, Physikalisch-Okohomische Gesellschaft, | | 6 |
| Landis, Mrs. Henry D., Philadelphia, Pa., . . . | 1 | |
| Lausanne, Société Vaudoise des Sciences Naturelles, | | 1 |
| Lawrence, Public Library, . . . . . | | 5 |
| Lee, F. H., . . . . . Newspapers, | 3 | 158 |
| Lee, Leslie A., Brunswick, Me., . . . . . | | 1 |
| Le Mans, Société d'Agriculture, Sciences et Arts de Sarthe, | | 2 |
| Lick Observatory, Trustees of, . . . . . | | 1 |
| London, Royal Society, . . . . . | | 9 |
| Loring, George B., . . . . . | | 1 |
| Lovell, John, Montreal, Canada, . . . . . | 6 | |
| Lowell, Old Residents' Historical Association, . . | | 1 |
| Lyon, Académie des Sciences, Belles-Lettres et Arts, . | 1 | |
| Lyon, Société d'Agriculture, d'Histoire Naturelle et des Arts Utiles, . . . . . Atlas, | 2 | |
| Lyon, Société Linnéenne, . . . . . | 2 | |
| Mack, Miss Esther C., . . . . . | 22 | 273 |
| Mack, William, . . . . . Newspapers, | | 120 |
| Madison, Wis., Department of Public Property, . . | 1 | |
| Manning, Francis H., Boston, Mass., . . Atlas, | 1 | |
| Manning, Robert, . . . . . Newspapers, | 1 | 58 |
| Marshall, John W., Rockport, Mass., . . . . | 1 | |
| Mason, Prof. Otis T., Washington, D. C., . . . | | 3 |
| McCalla & Stavely, . . . . . | | 1 |
| Meek, Henry M., . . . . . | 1 | |
| Mexico, Museo Nacional, . . . . . | | 2 |
| Middletown, Scientific Association, . . . . | | 1 |
| Miller, Lewis F., . . . . . | 2 | |
| Milwaukee, Wisconsin Natural History Society, . . | | 1 |
| Montpelier, Vt. Historical Society . . . . . | | 1 |
| Montpelier, Vermont State Library, . Newspapers. | | |
| Montreal, Canada, Geological Survey, . . . . | 1 | |
| Morrison, N. J., Springfield, Mo., . . . . . | | 1 |
| Morse, Prof. E. S., . . . . . | 1 | 13 |
| Moulton, John T., Lynn, Mass., . . . . . | | 1 |
| München, Königlich Bayerischen Akademie der Wissenschaften, . . . . . | | 1 |
| Myer, Albert J., Washington, D. C., . . . . | 1 | |
| Neal, Theo. A., Boston, Mass., . . . . . | | 1 |

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|---|---|---|
| Neubrandenburg, Verein der Freunde der Naturgeschichte in Meklenburg, | 1 | 1 |
| Nevins, W. S., Newspapers, | | 20 |
| Newark, New Jersey Historical Society, | 1 | 1 |
| New Bedford, Free Public Library, | | 1 |
| New Haven, Yale College Library, | 1 | 1 |
| New York, Academy of Sciences, | | 13 |
| New York, American Geographical Society, | | 6 |
| New York, Astor Library, | 5 | 11 |
| New York, Chamber of Commerce, | 2 | |
| New York, Genealogical Biographical Society, | | 4 |
| New York, Mercantile Library Association, | | 1 |
| Nichols, Andrew, jr., | | 1 |
| Oliver, Gen. Henry K., | 25 | 185 |
| Packard, Rev. Philo W., | | 1 |
| Palfray, Charles W., | 113 | 295 |
| Paris, Société d'Acclimatation, | | 12 |
| Paris, Société d'Anthropologie, | | 4 |
| Paris, Société des Etudes Historiques, | | 4 |
| Peabody, George L., | 2 | 1 |
| Peabody, John P., | 1 | 12 |
| Peabody, Mass., Peabody Institute, | 1 | 1 |
| Peele, Miss Eliza, | | 20 |
| Peet, Rev. S. D., Clinton, Wis., | | 4 |
| Peirce, B. O., Beverly, Mass., | 6 | |
| Peirce, Henry B., Boston, Mass., | 10 | 1 |
| Pennsylvania, University Medical Department, | | 1 |
| Perkins, A. C., Exeter, N. H., | | 5 |
| Perkins, Henry, Philadelphia, Pa., | 3 | 16 |
| Perley, Sidney, Boxford, Mass., | 1 | 2 |
| Philadelphia, American Philosophical Society, | | 3 |
| Philadelphia, Library Company, | | 2 |
| Philadelphia, Numismatic and Antiquarian Society, | | 5 |
| Philadelphia, Pennsylvania Historical Society, | | 4 |
| Philadelphia, Zoölogical Society, | | 2 |
| Phillips, Henry, Jr., Philadelphia, Pa., | | 4 |
| Phippen, J. H., | 45 | 77 |
| Pickering, Miss Mary O., | 7 | 5 |
| Plumer, Miss Mary N., | | 1 |
| Poole, Wellington, Wenham, Mass., | | 2 |
| Poole, W. F., Chicago, Ill., | | 1 |
| Pope, Miss Sarah N., | | 40 |
| Powell, J. W., Washington, D. C., | | 1 |
| Preston, Chas. P., Danvers, Mass., | | 1 |

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|---|---|---|
| Providence, Public Library, | 1 | |
| Providence, R. I. Historical Society, | | 2 |
| Putnam, Mrs. Eben, | 1 | 52 |
| Putnam, F. W., Cambridge, Mass., | | 7 |
| Rantoul, R. S., | | 1 |
| Richardson, F. P., | | 3 |
| Robinson, John, | 1 | 44 |
| Ropes, Joseph, | | 12 |
| Salem, Essex Lodge F. and A. Masons, | 1 | |
| Salem, Ladies' Centennial Committee, | 11 | 29 |
| Salem, Peabody Academy of Science, | | 6 |
| Sampson, Davenport & Co., Boston, Mass., | 23 | |
| San Francisco, Mercantile Library Association, | | 1 |
| Savannah, Georgia Historical Society, | | 1 |
| Scott, Lewis A., Philadelphia, Penn., | | 1 |
| S'Gravenhage, Nederlandsche Entomologische Vereeniging, | | 2 |
| Shanghai, North China Branch of the Royal Asiatic Society, | | 2 |
| Silsbee, Mrs. B. H., | 55 | 65 |
| Smith, Everett, Portland, Me., | | 1 |
| So. Hadley, Mt. Holyoke Female Seminary, | | 1 |
| Springfield, Mo., Drury College Library, | 2 | 61 |
| Stearns, Robert E. C., San Francisco, Cal., | | 1 |
| Stickney, G. A. D., | 2 | |
| Stilson, Arthur C., Ottumroa, Ia., | | 1 |
| St. Louis, Missouri, Historical Society, | | 3 |
| St. Louis, Public School Library, | | 5 |
| Stockholm, Académie Royale des Sciences, | | 4 |
| Stone, Rev. Edwin M., Providence, R. I., | 1 | 2 |
| Stone, Miss Mary H., | | 349 |
| Stone, Robert, Newspapers, | | |
| St. Paul, Minnesota Historical Society, | | 5 |
| St. Pétersbourg, Académie Impériale des Sciences, | | 11 |
| St. Pétersbourg, Jardin Impérial de Botanique, | | 2 |
| Sydney, Royal Society of New South Wales, | 6 | |
| Tasmania, Government of, | 1 | |
| Taunton, Eng., Somersetshire Archæological and Natural History Society, | 1 | |
| Taunton, Old Colony Historical Society, | | 1 |
| Taunton, Public Library, | | 1 |
| Thomas, W. W., jr., Portland, Me., | 1 | |
| Thomson, Peter G., Cincinnati, O., | 1 | |
| Topeka, Kansas State Historical Society, | | 1 |

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|---|---|---|
| Trafford, François W. C., | | 1 |
| Tromso Museum, | | 1 |
| Underhill, J. W., Cincinnati, O., | 1 | |
| Unknown, | | 40 |
| Upsal, Société Royale des Sciences, | | 3 |
| U. S. Bureau of Education, | 1 | 18 |
| U. S. Commission of Fish and Fisheries, | 1 | |
| U. S. Department of the Interior, | 59 | 13 |
| U. S. Department of State, | 1 | 7 |
| U. S. Engineer Department, | 3 | 1 |
| U. S. Life Saving Service, | 1 | |
| U. S. Lighthouse Board, | 11 | 6 |
| U. S. National Museum, | | 1 |
| U. S. Naval Observatory, | 1 | |
| U. S. Patent Office, | 1 | 54 |
| U. S. Treasury Department, | 1 | |
| Utica, N. Y., Oneida Historical Society, | | 1 |
| Washington, D. C., Smithsonian Institution, | 14 | |
| Waters, H. F., | | 54 |
| Waters, J. Linton, Newspapers, | 4 | 106 |
| Waters, Stanley, Newspapers, | 114 | 721 |
| Weymouth, Historical Society, | 1 | |
| Wheatland, H., | | 23 |
| Wheatland, Miss Martha G., Newspapers, | | |
| Wheeler, George M., Washington, D. C., | 5 | |
| Whipple, George M., | | 17 |
| Whitcher, Mary, Shaker Village, N. H., | 4 | 21 |
| Whitney, Mrs. Mary W., Lawrence, Mass., Newspapers, | 2 | 6 |
| Whittlesey, Col. Chas., Cleveland, O., | | 1 |
| Wien, Verein zur Verbreitung Naturwissenschaftlicher Kenntnisse, | 1 | |
| Wein, K. K. Zoologisch-botanische Gesellschaft, | 1 | |
| Wilkesbarre, Pa., Wyoming Historical and Geological Society, | | 1 |
| Willson, Rev. E. B., | | 18 |
| Willson, Rob't W., Cambridge, Mass., | 1 | |
| Wilmington, Delaware Historical Society, | | 1 |
| Winthrop, Robert C., Boston, Mass., | | 1 |
| Woodbury, Charles Levi, Boston, Mass., | | 1 |
| Wolcott, J. W., Boston, Mass., | | 1 |
| Worcester, American Antiquarian Society, | | 3 |
| Worcester, Society of Antiquity, | | 5 |
| Wright, F. V., | 25 | 48 |
| Würzburg, Physikalisch-medicinische Gesellschaft, | | 3 |

The following have been received from editors or publishers :—

American Bookseller.
American Journal of Science and Arts.
American Naturalist.
Antediluvian.
Beverly, N. J., Banner.
Canadian Naturalist.
Cape Ann Bulletin.
Danvers Mirror.
Essex Statesman.
European Mail.
Francis' Catalogue.
Gardener's Monthly and Horticulturist.
International Review.
Ipswich Antiquarian Papers.
Lawrence American.
Lynn Reporter.
Manataug Pebbles.
Monthly Index.
Musical Herald.
Nation.
Nature.
Newport Historical Magazine.
Newton Transcript.
Our Dumb Animals.
Peabody Press.
Peabody Reporter.
Publishers' Weekly.
Quaritch's Catalogue.
Sailors' Magazine and Seamen's Friend.
Salem Gazette.
Salem Observer.
Salem Post.
Salem Register.
Turner's Public Spirit.
Zoologischer Anzeiger.

Museum.—The specimens in natural history, including those in archæology, which have been given during the year, are on deposit with the Trustees of the Peabody Academy of Science, in accordance with previous arrangement. In addition to the above those of an historical character, or possessing artistic interest, have been arranged in the rooms. The following may be specified as contributors: Stanley Waters, Salem; J. M. Emanuel, Hong Kong, China; Mrs. C. H. Upton; E. S. Morse; Mrs. G. E. Wiggin, So. Peabody; T. O. Williams, Watertown, N. Y.; Estate of Mary C. Anderson; Augustus S. Brown; William P. Upham; William Mack; Mrs. Simeon Flint; Edwin R. Ide; Dorcas Nourse; Rev. C. C. Carpenter; Jonathan Perley; B. D. Hill, So. Peabody; E. Wheatland; Mrs. Charles Whipple, Newburyport; Stephen H. Osborne; C. W. Palfray; E. N. Walton; W. P. Andrews; J. A. Emmerton; Henry K. Oliver;

James W. Averill; Mrs. James Kimball; Mrs. B. H. Silsbee; N. A. Horton; Mrs. Charles Hoffman; Boston Public Library; Edwin C. Bolles; David Campbell; Charles T. Jenkins; Samuel Chamberlain; Leonard B. Harrington; George P. Osgood; Charles Haddock of Beverly.

Manuscripts have been received from Mrs. B. H. Silsbee; T. F. Hunt; Mrs. George Hall of Chelsea; Mrs. James Kimball; Stanley Waters; George L. Peabody; William R. Hubbard; Gilbert L. Streeter; Jonathan Perley; Mrs. Charles Whipple, Newburyport; David P. Carpenter; Mary Kittredge; Agnes F. Churchill; Charles W. Palfray; George Anderson; Mary O. Pickering.

The Secretary has arranged the log-books and sea-journals in the Library, numbering some three hundred and seventy-five, and the same will soon be indexed; several valuable additions have recently been made to this collection: contributions are solicited. These journals give a most interesting record of the commercial days of Salem, and constitute valuable material for history.

Financial. — The Treasurer's Report of the receipts and expenditures of the past year (condensed for printing).

RECEIPTS.

*General Account.*

| | | |
|---|---|---|
| Balance on hand at commencement of year | | $505 11 |
| Dividends of stocks, | $26 46 | |
| Return tax, | 11 40 | |
| Assessments of members, | 984 00 | |
| Publications, | 869 88 | |
| Excursions, Lectures, etc. (net), | 638 60 | |
| Salem Athenæum, | 193 13 | |
| | | $2,723 47 |

*Historical.*

| | |
|---|---|
| Dividends of stocks, | 65 50 |

*Natural History and Horticulture.*

| | |
|---|---|
| Dividends of stocks, | 36 00 |

*Davis Fund.*

| | |
|---|---|
| Interest of bonds, | 380 00 |

*Ditmore Fund.*

| | |
|---|---|
| Interest of bonds and stocks, | 180 00 |

*Manuscript Fund.*

| | |
|---|---|
| Interest of Savings Bank, | 21 26 |

*Ladies' Fair Fund.*

| | |
|---|---|
| Interest of bond, | 60 00 |

*Derby Fund.*

| | |
|---|---|
| Rent of land, | 30 00 |

*Howes Fund.*

| | |
|---|---|
| Interest of bonds, | 1,490 00 |
| | $5,491 34 |

## EXPENDITURES.

*General Account.*

| | | |
|---|---|---|
| Salem Athenæum, $350 and $175, | $525 00 | |
| Salaries, | 1,530 60 | |
| Publications, | 1,283 65 | |
| Sundry accounts, | 659 79 | |
| | | $3,999 04 |
| Balance of Treasurer on deposit at Salem Nat. Bank, | | 69 76 |

*Historical.*

| | |
|---|---|
| Books, etc., | 212 91 |

*Natural History and Horticulture.*

| | |
|---|---|
| Book-binding, etc., | 75 00 |

*Ditmore Fund.*

| | |
|---|---|
| Mr. Perkins' annuity, | 105 00 |

*Manuscript Fund.*

| | |
|---|---|
| Savings Bank, interest added to fund, | 21 26 |

*Howes Fund.*

| | |
|---|---|
| Purchase of bond, added to fund, | 1,008 37 |
| | $5,491 34 |
| The invested funds of the Institute stand, at cost, | $37,716 03 |

The American Academy of Arts and Sciences commemorated the one hundredth anniversary of its organization, in Boston, on Wednesday, May 25, 1880. The oration by Hon. R. C. Winthrop and addresses by other gentlemen present, were delivered in the Old South Church, followed by a reception in the hall of the Academy. Delegates were present from the various scientific

societies of Europe and this country. The Institute was represented by Messrs. Hagar and Rantoul.

During the session of the American Association for the Advancement of Science at Boston, in August, 1880, the members and their friends, at the request of the Trustees of the Peabody Academy of Science and the members of the Essex Institute, visited Salem on the afternoon of Monday, the 30th of August.

After examining the libraries and collections of these institutions, the party proceeded to Kernwood, the residence of S. Endicott Peabody, Esq., who extended a cordial invitation. The extensive grounds were thrown open to the visitors, and the time was pleasantly passed until the hour for departure arrived, in listening to the music of a band, partaking of a bounteous collation, and conversing with many of the citizens of Salem and vicinity, who were invited to meet them on this interesting occasion.

The annual contributions of books, pamphlets and other printed matter to the library, valuable manuscripts and relics of the olden times to the cabinets, also paintings, engravings, maps, etc., to the general collections, indicate to the officers, members and friends of the Institute the necessity of obtaining means to provide more suitable accommodations for the proper arrangement and classification of these increasing collections, so that the same may be rendered readily accessible to the student and enquirer for historical, statistical, scientific and general information. This want is now very sensibly experienced, and it is most ardently hoped that at no distant day the public spirited friends of the Institute, of literature, the arts, the sciences and history, will liberally respond.

# BULLETIN

OF THE

# ESSEX INSTITUTE.

VOL. 13. SALEM; JULY, AUG., SEPT., 1881. NOS. 7, 8, 9.


## VISIT TO CAMBRIDGE, WEDNESDAY, MAY 25, 1881.

BY the polite invitation of President Eliot, of Harvard University, and of Mr. F. W. Putnam and other officers having in charge the various museums, libraries, etc., that cluster around this venerable university, a party, consisting of members of the Institute and their friends, spent a very profitable and pleasant day in examining these several collections which, for the most part, have been gathered together during the past thirty years by a few devoted friends of science and of the University.

Left Salem by the 8.42 A. M. train for Boston, thence by horse cars to Memorial Hall, Cambridge, where Mr. Putnam was present to tender a cordial welcome. The party repaired to the Sanders Theatre, near by, where the program for the day was announced as follows: —

The Peabody Museum of American Archæology and Ethnology, Museum of Comparative Zoölogy, Gymnasium, Memorial Hall, Sever Hall, Library at Gore Hall, Chemical Laboratories and the Mineralogical Collections in Boylston Hall, the Botanic Garden and Herbarium, and the Observatory.

The day was fine. Many thanks are due to Mr. Putnam for his untiring efforts in contributing so largely to the enjoyment of the occasion.

MONDAY, JUNE 6, 1881.

MEETING this evening at 7.30 o'clock. The PRESIDENT in the chair. In the absence of the Secretary, Mr. W. P. Andrews was requested to act *pro tem.* Records of preceding meeting read. Donations and correspondence announced.

Messrs. Charles F. Rice and John E. Peabody, both of Salem, were elected resident members.

The recent visit to Cambridge, the cordial reception, and the facilities afforded to view the extensive and various collections, were referred to by the President, who briefly alluded to the benefactors of the University in aid of these departments.

The following resolutions were unanimously adopted, embodying the views and sentiments of the meeting, several members expressing their high appreciation of the courtesies extended.

*Resolved*, That the sincere thanks of the Essex Institute be tendered to President Eliot, and the several officers of Harvard College, who kindly opened the Museums, Gymnasium, Observatory, Library, and other collections under their especial charge, to the members of the Institute and their friends, during the visit to Cambridge on Wednesday, May 25th last; and for other courtesies extended to them on this interesting occasion.

*Resolved*, That the Secretary be directed to place these resolutions on the records, and to transmit a copy to President Eliot and his associates in the administration of the University.

The meeting then adjourned.

## Monday, June 20, 1881.

Meeting of the Institute this evening. Adjourned to Tuesday, June 21. The President in the chair.

Messrs. George E. Sperry and Frederick P. Richardson, both of Salem, were elected resident members.

The meeting then adjourned.

## Thursday, July 7, 1881.

Field meeting in Rowley this day, the party leaving in the 8.10 A. M. train from Salem on the Eastern railroad. At Rowley proceeded, in carriages, to the Town Hall, where the afternoon session was held and where the baskets were deposited. From thence, under the guidance of Mr. John H. Sears, the botanical section strolled into the woods in search of plants and flowers, while others went in different directions as inclination dictated.

This is an old and interesting town and was incorporated in 1639. It was named by Ezekiel Rogers, its early settler, for a Parish in York County, England. It had a fulling mill, owned by John Pearson, as early as 1643, and its first grist-mill was erected on Mill river, two years later, by Thomas Nelson. At the earliest period it was quite

noted for the manufacture, by the old process, of cotton hemp and flax cloth. Winthrop, in 1643, said that in this respect "Rowley exceeded all other towns."

The present appearance of the town is not uninteresting. It is a rural community, and not a few of its families date back from the beginning of the settlement. As in many of the old New England towns, some of its children, from an early period to the present time, have been wont to leave the old homestead, to colonize new places, or to seek the centres of trade, commerce and manufactures. This migratory propensity of our people has largely conduced to the settling of the extensive territory, constituting nearly, if not quite, the present area of the United States, under one general government, divided into states and territories. Many from the distant portions of the union, descendants of the first comers, visit, occasionally, the places where their emigrant ancestors first settled, and made for themselves homes in this, then unsettled, country.

To aid in thus perpetuating the memories of our ancestors and tracing the development of the growth of our country from these fountain heads — especially those located within the limits of the county of Essex — the germs, as it were, from which has evolved, by constant accretions, the country of to-day, is one of the leading objects of the Essex Institute.

How much the Institute has done, in this direction, can be seen by visiting its rooms in Plummer Hall, Salem, or in examining its various publications, treating on these and kindred subjects. What progress it will make in the future will largely depend upon the encouragement and support it receives from the citizens of the county, from those who have removed therefrom and made their homes

elsewhere, and from that class of large-hearted persons, whose mission appears to be the encouragement of all movements that tend to the advancement of general culture and the happiness of mankind.

Lunch was provided at 1.30 P. M. The afternoon session was held at 3 o'clock. The PRESIDENT in the chair. Records read by the Secretary.

MR. JOHN H. SEARS exhibited the flowers and plants collected during the day, describing the same with appropriate remarks. The following may be specified.

1 **Lupinus perennis** (*Wild Lupin*).
2 **Melampyrum Americanum** (*Cow Wheat*).
3 **Callitriche verna** (*Water Starworts*).
4 **Archangelica atropurpurea** (*Gt. Angelica*).
5 **Iris Virginica** (*Slender Blue Flag*).
6 **Raphanus raphanistrum** (*Charlok*).
7 **Rudbeckia hirta** (*Cone flower*).
8 **Calopogon pulchellus** (*Calopogon*).
9 **Hypoxys erecta** (*Star grass*).

MISS MARY N. PLUMER, of the State Normal School, Salem, read a very interesting and instructive paper on "The Dissemination of Seeds." See the paper on pages 121–147.

REV. JOHN PIKE, D. D., responding to the call of the chair, pointed out wherein certain features of nature are always the same, and, among other things, said that science and religion, that is, the best science and the highest religion, are going hand in hand.

REV. G. M. HARMON, of Peabody, spoke of the work of the "Village Improvement Societies" of western Mas-

sachusetts, the object of these organizations being the general improvement of the smaller towns of the state, the planting of trees, the laying out of parks, the matter of drainage, the removal of unsightly fences and other objects, etc.

Rev. Charles C. Bruce, of Rowley (one of Dr. Pike's successors), spoke of the practical effects of an increased knowledge of scientific things and of its value to man. He thought that religion had been advanced by science, and that it was now an exploded idea that science will subvert religion.

Mr. N. A. Horton alluded briefly to some of the historical incidents of the place,—a town old and interesting, a town of public spirit. He spoke of the history of Rowley, and in a humorous way alluded to the vexed question between Boxford and Rowley, as to which should have the credit of the capture of the cannon Nancy. Mr. Horton also offered votes of thanks to the selectmen of Rowley for the use of the town hall; to the town clerk, and the clergymen of the town; to Mrs. Sarah W. Cressy for polite attentions and for refreshments; and to the people generally for courtesies tendered the party.

Mr. John Robinson offered a vote of thanks to Miss Plumer for the paper of the day, speaking in complimentary terms of her treatment of the subject.

The above votes were unanimously adopted. The meeting then adjourned.

# DISSEMINATION OF SEEDS.

BY MARY N. PLUMER.

The one great object of the plant from the time of germination until the time of death is to provide nourishment for the formation and perfecting of the fruit, for the production and ripening of seeds. For this purpose every plant was created; for this, it exists; for this, it clings to life with wonderful tenacity under conditions the most adverse.

Varied as are seeds in their external form, their internal structure shows that all are adapted to the same great end, the forming of plants which shall possess the prominent characteristics of the mother plants. Each one contains, neatly packed away, all of the parts essential to the formation of a new plant; each one, although showing no signs of life, has within itself the principle of life, destined under favorable conditions to display itself. With truth has it been said that "the seed may be considered as that link in the chain of vegetable existence which binds the old plant to the new."

It has been found by careful examination that, from a morphological point of view, terminal ovules or seeds must be considered as the terminal portion of an axis, the lateral ones as equivalents of whole leaves, the marginal as branches of leaves (lobes, pinnæ, etc.). During the process of development, changes take place in the structure and texture of these parts by which they become fitted to perform the special offices assigned to them. When they have reached the stage of maturity, they separate, sooner or later, from the parent plant and, either

alone or surrounded by the pericarp, fall to the ground. Here, under peculiar and favorable circumstances, they germinate, continue to grow, and develop into new individuals possessing the important characteristics of the plants which produced them.

So long as scientific men believed that "the several species of plants were special creations formed to live in those countries in which now found," their habitat and mode of perpetuation called for no discussion; they were facts requiring no explanation. At the present time, however, with the advance that has been made in the study of plants, we find ourselves obliged to inquire what provision has been made for the dissemination of the seed; how it has come to pass that the same plants are found as members of the floras of countries widely separated; how that natives of the mountain-tops of certain lands are found, apparently growing wild, in polar regions far away; how that the fossil plants of some lands are the living plants of others; how that the plants of tropical regions are sometimes found flourishing on distant shores.

The answering of these questions is a work by no means easy since so many elements enter into the consideration, each one in itself important and each requiring a large amount of careful consideration. To understand fully all the means provided by nature for bringing about these results, we need a complete knowledge of the flora of the whole world, of the natural classification of living plants, of the forms of plant-life existing thousands of years ago but now extinct, of the known effect of changes in climate upon living organisms, of the changes that have been made in the relative position of land and water upon our earth, of the modern theory of the "origin and development of species."

"It is a law of nature that plants shall be diffused as widely as possible wherever the circumstances are favorable for their growth and welfare." The agents employed in the carrying out of this law with reference to plants are more numerous than those employed in the distribution of any other class of objects. This is largely due to their mode of propagation by seeds, to the length of time that seeds retain vitality, to the great extremes of heat and cold, of drought and moisture which they can endure without injury to the germ.

First among the natural modes of dissemination of the seed, because the most common, may be mentioned that produced by the action of the wind.

## DISSEMINATION OF SEEDS BY THE WIND.

The wind is one of the most efficient agents in the dispersion of seeds. The seeds formed by very many plants are minute, almost microscopic in size, and, when the seed-vessels which contained them burst, they float in the air until they reach a suitable place in which to germinate. Here signs of life begin to manifest themselves, the seeds burst their outer coverings, roots are formed, stems and leaves expand, and under the influence of light, heat, air, and moisture, plants flourish which, in their turn, develop seeds and scatter them broadcast through the air. The spores of lichens, mosses, and ferns are in this way scattered by the wind and, being very numerous, wherever the soil is adapted to the growth of such plants they cover it with their peculiar verdure and in many cases fit it for the growth of higher orders of plants. The seeds of many flowering plants are small, but very abundant. They are enclosed in peculiar capsules and, as these are moved to and fro by the wind, the seeds are scattered

far and wide. When we think how small, how inconspicuous these seeds and the spores which in Cryptogams take the place of seeds are, we do not wonder that we have either no ocular proof or but little such proof of this method of their transportation.

Many seeds are specially adapted for transportation by the wind from one place to another. This is peculiarly true of the seeds of the Compositæ many of which are furnished with a feathery appendage evidently designed to assist in the carrying of the seeds to a distance. As illustrations may be mentioned the *Taraxacum*, *Leontodon*, *Cirsium*, *Erechthites*, *Senecio*, *Gnaphalium*, and *Solidago*, popularly known as the spring and fall dandelions, thistle, fireweed, groundsel, everlasting, and goldenrod. These plants are members of the largest family of the vegetable kingdom and, if we consider the structure of their flowers, we shall be at no loss to decide why the family is so numerous and so widely scattered.

The *Taraxacum dens-leonis*, dandelion, may serve as the flower to be specially studied. With its brilliantly colored head resembling a flower, we are all familiar. The apparently single blossom is really a cluster of many sessile florets crowded together upon a common receptacle and surrounded by an involucre. Each floret is an illustration of the changes in shape which the organs of plants undergo in their adaptation to certain ends. The limb of its calyx is reduced to a tuft of hairs; the five little notches at the end of its strap-shaped corolla show how its five petals have been united into a gamopetalous corolla and altered from the tubular form by being split down the side and laid open; its stamens are united by their anthers around the forked style of the pistil. The tube of the calyx is incorporated with the surface of the ovary while its limb separates into a circle of hairs called

pappus and remains attached to the rostrate or beaked achenium; this pappus is persistent, increases with the ripening of the seed and, when the achenium with this light downy appendage is removed by natural or artificial means from the receptacle, it is borne hither and thither by the wind until it reaches a resting place where it germinates under favoring circumstances and, it may be, far from the plant which produced it.

Every breath of wind blows off the ripened seeds of the dandelion and carries them to places far and near so that we are not surprised that the weed is found "through Europe and Asia, from Arctic latitudes to Algeria and India, from Greenland to the Straits of Magellan; in Japan and New Zealand as well as in the Canary Islands; and on the Andes and Himalayas at an altitude of from 11,000 to 18,000 feet."

The thistle, which has become naturalized to such an extent as to have become in some parts of North America a perfect pest, is furnished with a similar silky appendage. When permitted to mature its fruit, the long spreading pappus, very large in proportion to the size of the seed, may be seen floating the achenia by hundreds through the air and thus disseminating the intruder far and wide.

*Erigeron Canadense*, a very common weed furnished with a similar pappus, was carried from America to a botanical garden in Paris and Linnæus said that "in less than a hundred years the seeds had been so distributed by the wind that it flourished in France, the British Islands, Italy, Sicily, Holland, and Germany."

In an article on the distribution of plants, A. R. Wallace says "When we consider the enormous quantity of seeds produced by plants, that great numbers are more or less adapted to be carried by the wind, that winds of violent and long duration occur in most parts of the

world, we are as sure that seeds must be carried to great distances as if we had seen them so carried; such storms carry leaves, hay, dust, and many small objects to a great height."

With the peculiar globular shaped fruit of the *Platanus*, or buttonwood-tree, most are familiar. It remains suspended like a little ball from the branches of the tree during a large part of the winter until, by the action of wind and snow, it falls to the ground. There it lies until the nutlets separate when each with its tuft of hairs is carried hither and thither by the wind until it reaches a resting-place.

The styles of the *Clematis alba*, during the ripening of the seed, develop into long feathery tails which remain attached to the achenia and render the latter fitted to become scattered by the wind. While the pericarps with their richly fringed styles are attached to the receptacle, they give to the vine, as it hangs in festoons from the branches of shrubs and trees, a peculiarly attractive appearance.

The fruit of some of our forest trees, as the maple, the ash, and the elm, receives the name samara. In all except the first it is an indehiscent, one-seeded fruit, furnished with a membranous wing. This wing which assists in the dispersion of the seed is an outgrowth of the pericarp. In the ash, the wing is terminal; in the elm, it surrounds the body of the pericarp; in the maple the fruit is a double samara, that is, it consists of two united indehiscent pericarps each enclosing a seed and developed at one extremity into a wing.

The fruit of the *Liriodendron tulipifera*, tulip-tree, consists of numerous one- or two-seeded winged carpels, dry and indehiscent. These carpels consist of long flat styles imbricated in the form of a cone and, as the seeds

ripen, they become samaræ, separate from the central axis of the cone, and, being furnished with a wing, may be easily wafted to a distance by the wind.

Appendages or outgrowths of the testa, the outer covering of the seed, frequently have reference to dissemination by the wind. Such appendages belong to the seeds of dehiscent fruits, also to the peculiar fruit of cone-bearing trees. The wing of a pine seed, which is a part of the carpellary scale upon which the two ovules grow, is an example of such an outgrowth. The flowering female catkin consists of bracts arranged in a spiral upon an axis; in the axil of each bract is formed a scale which bears two ovules and which is therefore called a carpellary scale. After fertilization the imbricated scales protect the ovules as carefully as would a closed pericarp. The cones remain closed on the trees for at least one season after fertilization. When the hot weather of the next summer has continued for some time so as to dry the cones thoroughly, the scales open with a sudden spring, ejecting the seeds which, being rendered buoyant by the wing before-mentioned, are committed to the wind that the seeds may be borne away and the range of the species extended. If a number of these cones happen to open together, the noise of the cracking can be heard to a considerable distance.

Alders and birches which are so abundant in the cool regions of the northern hemisphere produce cones similar to those produced by pines, spruces, and larches, yet, in some respects, unlike them. The seeds of the birch become winged and scale-like nutlets, or small samaræ. These seeds are often carried by the wind to the lofty summits of rocks and mountain peaks and, for this reason, birches are found in all parts of northern Europe, Asia, and America where heavy seeds like those of the oak and the hickory cannot follow.

In the *Tecoma radicans*, trumpet-creeper, a beautiful climber extensively cultivated in New England, an entire wing surrounds the body of the seed. In the catalpa, a plant closely allied to the last mentioned, the testa is extended at each end into a membranous wing, fringed and comose at the ends. As the pods containing the seeds open, great numbers of seeds are liberated and quickly scattered by the wind.

The seeds of *Asclepias*, milkweed, are thin, flat, and of a brownish color. They are produced in great numbers and are arranged upon a large placenta which separates at maturity from the suture. At one end of each seed are many soft, satiny hairs called the coma. When the seeds are ripe they become separated from the placenta and the lightest breath of wind wafts them away from the follicle and to their destined resting-place. The evident design of the coma is to assist in the wide-spread distribution of the species. Many of the seeds probably fall near the plant which produced them, while chance breezes carry others to a great distance.

The seeds of *Epilobium*, or willow herb, are endowed with a similar tuft of silky hairs to assist them in their wanderings. This plant is often one of the first to grow on land which has been burned and, for this reason, it has been called in Maine and Nova Scotia fireweed. The coma of the seeds causes them to be wafted by the winds and, finding the ashes and burnt soil specially adapted to their germination and growth, they speedily take possession and flourish.

The seeds of plants belonging to the order *Salicaceæ*, the willows and the poplars, are furnished with a very abundant silky or cottony down. The abundance of this down on the fruit of one variety of poplar, *Populus balsamifera*, makes the tree a disagreeable neighbor during the period of fruiting.

"The wing and coma of seeds are functionally identical with the wing of the samara and with the pappus of the pericarp in the achenes of the Compositæ, but morphologically are unlike them."

*Tilia Americana*, the linden-tree, has a somewhat peculiar mode of dispersing its seeds. Its flowers appear in clusters in the upper axil of a leaf, the stem of each cluster being attached for about half its length to a ribbon-like bract of about the length of the stem. The fruit, which is a round nut of about the size of a pea, remains attached by the stem of the flower-cluster to the bract before-mentioned. As this falls from the tree the bract, moved by the wind, spins around and travels quite a distance. When, as is often the case, the tree stands on the shore of a pond or river, the seeds fall upon the surface of the water and the winged appendage, acting as a sail, wafts the seeds to various points on the opposite shore.

The structure of the pericarp in some fruits is such that by means of it they are wafted to a distance. This is true of *Staphylea trifolia*, *Colutea arborescens*, and *Cardiospermum halicacabum*, which last from its inflated capsule is called the balloon-vine. The inflated seed-vessels of these plants seem intended for the purpose of wafting the seeds by exposing to the wind a large, light body.

Many plants not possessing any of the before-mentioned peculiarities are carried off bodily by the wind to distant localities. "The rose of Jericho," *Anastatica hierochuntica*, one of the Cruciferæ, has this method of dissemination. Its short stem separates into long, spreading branches; its leaves are obovate; its flowers are small, white, sessile, and are succeeded by pods which begin to ripen on the approach of dry weather; the branches

before soft and juicy and spreading become hard and woody and curl inward so that, when the fruit is ripe, the plant appears like a curious ball on a short stem; most of the root dies and the fierce winds of autumn uproot the dead plants and carry them to a great distance. If, in its course, the ball is thrown upon a pool of water or reaches a damp place, the branches unfold under the influence of the moisture, and the pods open and discharge their seeds, it may be at a great distance from the locality where the plant developed. This plant grows abundantly in Palestine and many specimens of it have been brought from that country as curiosities. When placed in water, these plants, although they may be many years old, absorb moisture, expand, and assume the appearance of plants suddenly brought to life.

*Selaginella lepidophylla*, a Lycopod, native of southern California and northern Mexico, has the same strange habit; hence one of its common names, resurrection plant. When the ground where it grows becomes parched, it curls itself into a little ball, loosens itself from the earth, and is then driven over the ground by the wind. When it reaches a place suited for its growth, it uncurls itself, takes root, and flourishes until its new home becomes parched when it seeks another locality. As it is thus bodily carried from place to place, its spores are scattered by the wind and it is therefore widely disseminated in the regions fitted for its growth.

### DISSEMINATION BY WHIRLWINDS, HURRICANES, ETC.

Large quantities of leaves and other vegetable débris are often carried by whirlwinds to very great heights in the air and, entering strong upper currents, may be carried far away before dropping to the surface. Mingled

with this débris may be found the spores of Cryptogams and the seeds of Phanerogams which, on reaching a soil adapted to their development, may spring up and flourish. In this way has been explained the abundant growth of certain species of plants on islands far away from the continent on which the species were indigenous.

Tornadoes, hurricanes, and cyclones often sweep along at the rate of ninety miles per hour and may carry with them heavy fruits and seeds over seas of considerable width.

## DISSEMINATION CAUSED BY THE ELASTICITY OF THE PERICARP.

The pericarp of many fruits is possessed of a certain amount of elasticity. This displays itself at the time of the maturity of the seeds by causing the pericarp to open with a sudden spring and thus throwing the seeds with violence and often to a great distance. Many examples of this peculiar property might be named—among the most prominent and familiar are the capsules of *Echinocystis*, *Geranium geum*, *Fraxinella*, and *Impatiens* which discharge their seeds with a peculiarly effective jerk.

The pericarp of *Impatiens* consists of one cell opening by five valves, and is one of the most common examples. If accidentally touched when ripe, it will immediately burst open; while the valves, coiling themselves in the form of spirals, spring from the axis, discharge, and scatter the seeds. Hence the common name of one species, touch-me-not.

Mr. Thomas Meehan in an article published in the American Naturalist says, "While travelling through a wood recently, I was struck in the face by some seeds of *Hamamelis Virginica*, the common witch-hazel, with as

much force as if they were spent shot from a gun. I gathered a number of capsules to learn the cause of the projecting force and the measure of its power. Laying the capsules on the floor, I found the seeds thrown generally from four to six feet and, in one case, twelve feet away. The cause was the contracting of the horny endocarp surrounding the seed. The seeds were oval and in a smooth, bony envelope and when this had burst and expanded enough to get just beyond the middle where the seed narrowed again, the contraction of the endocarp caused the seed to slip out with force."

The woody fruit of the sand-box-tree, an American tree of the order Euphorbiaceæ, *Hura crepitans*, is composed of from twelve to eighteen cocci which, having become dry, open suddenly at the back with two valves and are detached from their axis with a kind of detonation. "These fruits have been actually surrounded by iron wires, yet the force with which they expand has been such that the valves have been separated from one another."

### DISSEMINATION ASSISTED BY THE ACTION OF MOISTURE UPON THE FRUIT.

"The fruit of *Erodium gruinum*," says Sachs, "and of other Geraniaceæ splits up into five mericarps each of which has the form of a cone with the apex pointing downwards, containing the seed and bearing a long awn. When moist this awn is stretched out straight, but if it becomes dry while lying on the ground, the outer side of the awn contracts strongly, causing the upper end to describe a sickle-like curve which brings its point against the ground, the cone being thus placed with its apex downwards. The lower part of the awn now begins to

contract into narrow spiral coils, causing the cone to turn on its axis and to penetrate the ground, and the erect hairs on it which point upwards retain it there like grappling-hooks. After the cone has penetrated the ground, the twisted part of the awn does the same, driving the part which contains the seed further and further into the soil. If the mericarp now becomes moistened, the coiled part attempts to straighten itself but its coils are held by the hairs which stand on the convex surface; and this movement also contributes to drive the cone deeper into the soil. Whether therefore the moisture is greater or less, the mechanical contrivance produces the same effect, namely, to drive the part of the mericarp which contains the seed into the soil."

The twisted awn of *Avena fatua*, or wild oats, and of some other plants, seems to have been specially intended to aid the further dispersion of the seed on being discharged from the plant. This spiral awn or spring which is beset with a multitude of fine, minute hairs possesses the property of contraction by drought and of expansion by moisture; hence it remains in a perpetual state of contraction and dilatation dependent on the weather. From these changes in the length of the awn, as well as from the additional aid of the fine hairs which act as so many fulcra and cling to whatever object they meet, the seed to which it is attached remains in motion until it germinates or is destroyed. When the seeds of oats are ripe, it is said that they are projected with such violence that in a dry day one may hear them thrown out with a slight, sudden snap.

Darwin experimented with the seeds of *Stipa pennata*, feather grass, and reached conclusions nearly identical with the preceding.

### DISSEMINATION FAVORED BY THE PLACE OF GERMINATION.

By a peculiar provision of nature, the increase in the number of mangrove trees is insured. The seeds of the mangrove germinate before leaving the fruit. The long, thick radicle pierces through the testa and the pericarp, and the young plant rapidly grows downward until the fruit falls off when the roots penetrate the mud. After this the plant rapidly increases until it becomes a large tree.

### DISSEMINATION OF SEEDS BY MOUNTAIN STREAMS.

A mountain stream or torrent frequently washes down to the valley seeds which have accidentally fallen into it, or which the water has swept from the banks as it has overflowed them. These, as one stream unites with another until a broad river is formed, are carried by it to remote localities sometimes to the mouth, and there, if they are dropped upon a soil suited to their growth, the seeds spring into life and cause a growth of plants unlike those in the vicinity. Thus the shores of the Baltic are visited by seeds from the interior of Germany; the shores of the Gulf of Mexico, by seeds from the northern and western parts of the United States.

### DISSEMINATION BY RIVER-RAFTS.

In large rivers there is often found a formation called a river-raft; it consists of pieces of logs and timber fastened together by various substances which they have collected in their journey from the source of the river. These constantly increase in size and sometimes form a natural bridge across the river. Sometimes in the débris,

consisting of rich soil from the forests through which the stream flows, seeds germinate and, as the depth of soil increases, the plants springing from these seeds flourish with unwonted vigor hundreds of miles from the places where these seeds were formed and ripened. In some cases they have been seen covered with a growth of green bushes and small trees.

Rivers running east or west carry seeds and extend the limits of species, while those running north or south are not so likely to carry the seeds to a climate suited to their development.

Sir Charles Lyell tells us, in his Geology, that, among the Moluccas, floating islands, similar to the river-rafts before-mentioned, are often seen. On these, mangrove trees as well as undershrubs and a multitude of smaller plants flourish. Similar rafts with trees on them have been seen after hurricanes in the neighborhood of the Philippine Islands.

### DISSEMINATION BY ICEBERGS.

Icebergs are very often loaded with débris in which earth and seeds may be found. The seeds germinate and plants begin to grow in the alluvial soil of the iceberg, sometimes becoming of considerable size. If the iceberg, driven by currents and winds, is at last stranded on some distant shore, these wandering plants may become permanently established.

### DISSEMINATION BY OCEAN-CURRENTS.

Ocean-currents, too, are efficient carriers of plants and of seeds. The seeds of grasses and sedges are often enveloped in chaffy glumes; thus protected they may be

carried by the wind over long distances and, if dropped into the sea, may reach land by means of surface currents. The grasses are mostly wind-fertilized and can therefore establish themselves in any place whose climate and soil are adapted to the germination of the seeds and to the growth of the plants.

Heavy seeds and dry fruits, especially if inclosed in a hard shell, may be exposed for a long time to sea-water without injury to their vitality; they may be conveyed across the sea for long distances by winds and surface-currents. Double cocoa-nuts cross the Indian Ocean from the Seychelle Islands to the coast of Sumatra. West Indian beans frequently reach the west coast of Scotland. "Large seeds which have floated from Madagascar and Mauritius, around the Cape of Good Hope, have been thrown on the shores of St. Helena and have there sometimes germinated."

When once established in climate and soil adapted to their habits and constitution, plants soon take possession of a country, often extirpating the native plants. The cocoa planted on a coral island becomes the progenitor of a flourishing grove of cocoa palms. This is the case on islands of the Pacific whither the seeds have been carried by ocean currents.

The Gulf Stream aids greatly in this work. By its aid the seeds of West Indian plants are carried annually to the shores of Ireland, Scotland, and Nova Zembla. To Bermuda the currents carry objects, animate and inanimate, and almost without number from the Caribbean Sea. These include the seeds of shrubs and trees and of tender plants; they are frequently cast ashore and germinate. Plants on the coast of Brazil and Guiana are identical with those on the banks of the Congo and, as the seeds of those plants are capable of resisting the

action of sea-water and of retaining vitality for a long time, it is sensible to conclude that the seeds crossed the ocean.

Linnæus in speaking of this method of dissemination said, "Seeds embark upon the rivers which descend from the highest mountains of Lapland and arrive at the middle of the plains and the coasts of the seas. The ocean, too, throws, even upon the coasts of Norway, the nuts of the mahogany and the fruit of the cocoanut tree which have been borne on its waves from the far distant tropical regions; and this wonderful voyage is performed without injury to the vital energy of the seeds."

Experiments made by Darwin prove to us without doubt that this method of distribution of plants is one of the most important, though occasional, methods of producing a change in the flora of a country. In "Origin of Species," he describes several interesting experiments from which he reached the conclusion that the seeds of fourteen plants in every hundred "belonging to one country might be floated across nine hundred twenty-four miles of sea to another country, and when stranded, if blown by an inland gale to a favorable spot, would germinate."

### DISSEMINATION BY GLACIAL ACTION.

In studying the geographical distribution of plants, one is struck with the identity of plants on mountain summits separated from each other by hundreds of miles of lowlands over which it seems impossible that these plants could have migrated. Thus it has been found that many species of plants living in the Alps and Pyrenees are identical with those of northern Europe; that the plants of the White Mountains are like those of Labrador and like those on the highest mountains of Europe.

Such facts as these have led to many discussions and the belief at present is that, during the Glacial Period which is plainly marked by bowlders and scored rocks in various parts of Europe and America, as the southern regions became fitted for the plants of the north these latter took the place of the original inhabitants of the warm region; those of these warm regions travelled farther south so that the soil of temperate regions became covered with plants from arctic regions and that of tropical regions with plants from the temperate regions. As this period was succeeded by one of increasing warmth, the reverse process was carried on, one result being that at its close there were found on the tops of the mountains the plants originally found in the cooler northern regions.

We can also thus understand why European and American plants are so closely allied; for then, as now, the northern lands were nearly united and the same plants probably flourished in all parts of the polar regions; as the cold period moved from north to south on certain meridians, so the plants of northern regions moved south and, with the increase in the distance between two meridians as they extend towards the equator, became scattered over broad tracts of country.

### DISSEMINATION BY BIRDS.

Birds must be mentioned among the important agents in the dispersal of seeds over a broad expanse of land or of water. Many seeds are thus dispersed because their fleshy pericarps are used for food. Birds often carry cherries to some convenient place for eating the pericarp. The stone, not being useful for food, is dropped and from it there may spring up cherry trees far away from the tree which produced the fruit. In some places these are

found abundantly along stone walls on which the birds have rested.

Sometimes the seeds of plants are taken into the stomach and afterwards rejected in a fit state for germination. This is true of the seeds of berries like those of the mistletoe which the thrush swallows and afterwards deposits on the boughs of trees adapted to the growth and development of the plant. Seeds of currants are often swallowed by the blackbird and one may occasionally see a currant bush growing out of a tree upon which a seed was left by the bird in an opening in which earth had collected.

It is surprising that seeds have the power to resist the heat and digestive action of the stomach of animals, but it is undoubtedly the fact that some seeds seem to require it. An English botanist tells us that seeds of the *Magnolia glauca* carried to England refused to vegetate until they had undergone this process.

We are told that in England the brown linnet feeds upon thistle seeds and, in trying to obtain them, "perches on the top of the stalk and tears the downy head asunder in order to reach the seeds which are attached to the receptacle. During the act, many of the seeds are loosened and carried away by the breeze to places far distant from the parent stem, the bird being in this instance the indirect disseminator of the thistle. Were the head not rent asunder in this fashion it would most probably be soaked by the rains of winter and fall down only a few inches from the original stalk instead of being transported, as it frequently is, across many miles of country." "What is here told of the linnet," says Macmillan, "may be witnessed in any 'thistlery' on a fine September day when the birds are feeding in flocks."

Birds when they migrate from a colder to a warmer climate or from a warmer to a colder often carry seeds

which retain their vitality and, under favorable circumstances, grow.

Many aquatic birds build their nests on the ground far from the water's edge and, being wanderers, must often aid in the dispersal of seeds having hispid awns, hooks, or prickles by which they become fastened to the feathers of the birds. Some species of birds burrow in the soil and in burrowing get their feathers covered with vegetable mould which may contain seeds and spores in large numbers. Earth often becomes attached to the plumage of ground-nesting birds or to the feet of aquatic birds, and Darwin has proved by actual experiment that all such earth contains seeds. On page 328, "Origin of Species," he says, "Although the beaks and feet of birds are generally clean, earth sometimes adheres to them. . . . . The leg of a woodcock was sent to me by a friend, with a little cake of dry earth weighing only nine grains attached to the shank; and this contained a seed of toad-rush which germinated and flowered. . . . . Prof. Newton sent me the leg of a red-legged partridge which had been wounded and could not fly, with a ball of hard earth adhering to it and weighing six and a half ounces. The earth had been kept three years, but when broken, watered, and placed under a bell-glass, no less than eighty-two plants sprang from it. . . . . With such facts before us, can we doubt that the many birds which are annually blown by gales across great spaces of ocean, and which annually migrate, for instance the millions of quails across the Mediterranean, must occasionally transport a few seeds embedded in dirt adhering to their feet or beaks?" . . . . "Wading birds wander more than those of any other order. They frequent the muddy edges of ponds and are most likely to have muddy feet. They are occasionally found on the most remote and barren islands of

the open ocean; they would not be likely to alight on the surface of the sea, so that any dirt on their feet would not be washed off; and, when gaining the land, they would be sure to fly to their natural fresh-water haunts." Darwin tried several experiments to show that the mud of ponds is charged with seeds, the most striking one being the following:—"I took in February," he says, "three tablespoonfuls of mud from three different points, beneath water, on the edge of a little pond; this mud, when dried, weighed only six and three-fourths ounces. I kept it covered up in my study for six months, pulling up and counting each plant as it grew. The plants were of many kinds and were five hundred thirty-seven in number, and yet the viscid mud was all contained in a breakfast cup! Considering these facts, it would be an inexplicable circumstance if water-birds did not transport the seeds of fresh-water plants to unstocked ponds and streams situated at very distant points."

When considering birds as seed-carriers, the "succession of forest-trees," a subject about which much has been written, is naturally suggested. When a forest springs up naturally where none of its kind has been known to exist, we do not hesitate to say that it sprang from seeds. The lighter seeds, as maples and pines, were carried by the wind; the heavier, as nuts and acorns, by birds and squirrels. When an oak wood is cut down, a pine forest does not immediately spring up, unless in the neighborhood there are pine trees. This is a view opposed to that of many who suppose that in this and in similar cases the trees of the new forest have sprung from seeds spontaneously produced, or which have lain dormant for hundreds of years, or which may have been led to show signs of life by heat from a fire. So, too, when a pine forest is succeeded by an oak, the explanation is simple. Squir-

rels are known to carry to pine forests stores of acorns and other nuts and there conceal them for future use. In some cases the squirrels are killed; in others they neglect to return to the storehouse; and the result is the germination of many of the seeds in the succeeding spring. For this reason, we often find little oaks and hickories springing up in pine forests, and, if the pines are cut down or in any way destroyed, the trees which have already commenced to grow will assert themselves, and the hard woods will succeed the soft.

William Bartram, an American naturalist of the last century, wrote as follows: — "The jay is one of the most useful agents in the economy of nature for disseminating forest-trees and other nuciferous and hard-seeded vegetables on which they feed. Their chief employment during the autumnal season is foraging to supply their winter stores. In performing this necessary duty they drop abundance of seed in their flight over fields and hedges and by fences on which they alight to deposit the seeds in the post-holes, etc. It is remarkable what numbers of young trees rise up in fields and pastures after a wet winter and spring. These birds alone are capable in a few years' time to replant all the cleared lands."

### DISSEMINATION BY ANIMALS.

Many seeds attach themselves, by means of hooks and hairs, to the bodies of animals which come in contact with the plant in their search for food, and thus become involuntary agents in the dissemination of the seed. The hooks or hairs serve as points of attachment, and by them the seed remains fixed so that it may be carried about by the animal until detached by some accident and committed to the soil. In *Bidens* and *Myosotis*, the hooks are at-

tached to the seeds themselves; in *Galium aparine*, to the pericarp; in the thistle and burdock, to the involucre; in *Agrimonia*, to the dry calyx. In some species of *Geum*, the style becomes hooked at the tip for adhesion to the fleece of animals. The jointed pods of *Desmodium* attach themselves by means of minute hairs to the fleece of animals or to clothing and are thus readily carried from place to place.

Squirrels, as before-mentioned, often hoard large quantities of fruit, sometimes burying it in the ground and at others in hollows in the trunks of trees. When this supply is discovered by an animal not caring for the fruit, it is often scattered, and, coming in contact with the moist earth, the seeds germinate. This means of the dispersion of the seeds was noticed by the Indians, who had a tradition that squirrels planted all the timber of this country.

Certain quadrupeds, particularly the grass-eating, as the reindeer which live on the plains of Siberia, and which at certain seasons migrate in herds, assist in the dispersion of seeds.

Darwin states that he found that many fresh-water fish consumed the seeds of land and water plants, that these fish were eaten by birds, such as the heron, and that by the birds, as they took their flight and went to other waters, the seeds were transported, it might be, many miles from the place where they were eaten by the fish.

### MAN THE DISSEMINATOR OF SEEDS.

While birds and the lower animals are involuntary agents in the distribution of seeds, man voluntarily and purposely introduces plants from one country to another. This he does from various motives, the most prominent being the desire to cultivate useful plants and to beautify

his home. Sometimes, too, he becomes the unintentional agent in disseminating seeds, as when with the seeds of wheat he introduces those of noxious weeds.

From the history of the different nations of the world we learn how, by wars and by the frequent migration of tribes, plants were carried from country to country. In Europe, even in modern times, armies have been known to carry grains and cultivated vegetables from one extremity of the continent to the other during the time of wars. Great numbers of new plants have been found in France in the vicinity of places to which the Germans carried food for their horses.

From the time of the discovery of our own land to the present time, we have been receiving additions to our native plants and freely giving of our own to other nations. Among the plants earliest introduced were those useful for food and medicine, such as the various cereals, apples, pears, quinces, etc., *Datura*, *Verbascum*, *Tanacetum*, *Artemisia*. Plants useful in the arts were soon added to the number cultivated, while those with beautiful flowers or foliage quickly followed, and those remarkable for peculiarities in structure were not omitted from the list of introduced or exotic plants.

When the introduction of these plants is of recent date, we have no difficulty in tracing the origin, but when such introduction took place a long time ago it is difficult, almost impossible, to do so, and especially difficult because the number introduced unintentionally is in excess of the number introduced intentionally.

The common plantain, called by the Indians "the white man's foot," follows the steps of the European. One species has become so extensively naturalized as to have become a nuisance in some sections of the United States. Its seeds are of about the size and weight of those of red

clover and, when once mixed with the latter, cannot be readily separated, and hence in cultivating the clover the plantain is disseminated.

Chickweed, called by the New England savage "the mark of the pale face," is a native of Europe, but is now found in nearly all parts of the world.

Some of our most troublesome weeds have been brought to us from Europe. *Cirsium arvense*, *Onopordum Acanthium*, and *Lappa officinalis*, better known, perhaps, by the names, Canada thistle, cotton thistle, and burdock, are very common examples of such plants. *Taraxacum dens-leonis*, the common dandelion, too, is a foreign plant, not very disagreeable, but so thoroughly naturalized as to be more abundant than welcome in some pastures and meadows. Whiteweed, called now by the more euphonious name, Marguerites, is another intruder which has obtained exclusive possession of some fields.

Soil raised to the surface in the digging for railway cuttings and embankments is often covered with a growth of plants, strangers in the locality. These sometimes survive a few years and then disappear as the natural vegetation of the section gains strength and kills the intruder; at other times, the new plants continue to flourish.

By commerce, the most pernicious weeds have spread from Europe to America and India where they have made themselves at home sometimes by their wonderful vitality usurping the place of the native plants. Whiteweed and woadwax, *Leucanthemum* and *Genista*, two of the greatest pests of Essex County, were thus introduced.

From the West in 1855, *Rudbeckia hirta* was brought in hay seed to New England and now bids fair to usurp a place in our fields that should be occupied by useful plants.

Seeds are often found in the fleeces of wool carried

from Mexico, La Plata, and Buenos Ayres to Europe. In the process of cleaning these fall out and often spring up in the new soil. This has been noticed particularly at the port of Montpellier where American wools are received to be purified; here the seeds of many American plants have sprung up and obtained possession of the soil. Dr. Shaw mentions the similar introduction of a European plant, *Xanthium spinosum*, into South Africa; its spiny achenia cling to the wool of Merino sheep.

Many plants now naturalized here have been brought as garden plants, others have been found in the materials used for packing merchandise brought from foreign countries, and others have been brought with the materials used for new manufactures. As an instance of the last named may be mentioned the introduction into Tapleyville, in the vicinity of a carpet factory, of several species of foreign plants.

In the ballast in vessels sailing from many parts of the world, the seeds of foreign plants are often found and these springing up increase the number of plants not natives of the soil.

In the "Flora of Essex County," lately published by Mr. Robinson, one can find the names of many plants thus introduced into this country. In this, it is stated that the latest arrival noticed is *Eleusine Indica*, a weedy oriental grass common in New York and Philadelphia. It has made its appearance along the railroad tracks at the Pennsylvania Pier, Salem, having travelled thence by the steamers which regularly bring coal from Pennsylvania.

America has sent to Europe only a very few weeds. Dr. Seemann says this is because our present flora is older than the Germanic flora which now constitutes the principal vegetation of Europe. America and Australia have not attained to the degree of floral development to which

Europe has attained, consequently plants coming to Europe from Australia and America would not come as colonists to play a new part in that country but as the survivors of an older flora whose cycle of existence has ages ago run out there. The former geological flora of Europe has exhausted its capabilities in it and plants of this flora, returning at a later date from another country, find in it no circumstances suitable for their growth. On the other hand, European plants going to Australia and America encounter there an older flora about to pass away in the altered conditions of the world. The older flora has no chance with the newer and better equipped flora coming for the first time in contact with a soil to which it is altogether virgin.

The facts here cited are sufficient to show that abundant means have been provided for the dissemination of seeds and for the appearance in various parts of the world of plants originally created in places far distant.

## Wednesday, August 3, 1881.

Field meeting at Marblehead Neck to-day. Some one hundred or more persons were present, and were provided with special cars by the Eastern Railroad on the 9.45 A. M. train to Marblehead; thence by steam ferry "Escort," Capt. E. A. Pitman, to the Neck. By the kindness of Mr. Frank R. Kimball, a member of the Field meeting committee, his new house was placed at the disposal of the Institute for the lunch; accordingly the baskets and wraps were there deposited. The party then separated into squads, and rambled about the beaches and bluffs, at pleasure, to enjoy the beautiful scenery or to search into the wonders of the bold promontory which helps to land-

lock the deep waters of Marblehead harbor, and render it a safe anchorage from the storms. The day was warm, and a fog enveloped the ocean for a portion of the morning, but the views were delightful; and as the fog lifted for a season, the tops of the islands near by, and portions of vessels could be seen, giving a weird and supernatural effect.

Many changes have taken place since the time of the first field meeting here on Sept. 8, 1858. The place of rendezvous was then, the seed room of Mrs. Ephraim Brown, whose farm occupied a greater portion of the Neck and the well-tilled fields resembled large beds of a garden; some 240 acres were under cultivation and tillage, 25 acres under hoe culture, the hay crop about 100 tons annually, onions about 1500 barrels, besides cabbages, carrots, squashes, etc. The facilities of the sea manure had been of great practical value.

At the afternoon session of that meeting, Rev. J. L. Russell spoke of the medusa or jelly-fish, Mr. J. J. H. Gregory of the geology of Marblehead, Mr. C. M. Tracy of the flora, and Mr. Moses G. Farmer on the absorbing topic of that day, the Atlantic cable, a piece of which he exhibited. We notice, to-day, a great change; a pleasant and attractive village by the sea has sprung up, as it were, in a day, with its many beautiful cottages; by some called "Manataug," though the native inhabitants of Marblehead are somewhat restive over this assumed name.

A hall has been erected, by the Marblehead Neck Association, for the religious services on Sundays and for social gatherings on other days. A post-office has been established, and a little sheet occasionally printed, with the other outgrowths incident to a new settlement.

The afternoon session was held at 3 o'clock in the hall

above referred to, kindly placed at the disposal of the Institute by the officers of the association. The PRESIDENT in the chair. The records of the preceding meeting read by the Secretary.

The PRESIDENT spoke of the tendency, prevailing at the present time, to resort to the seashore and there spend the heated term. Every available space on our coast, especially on the northern shore of Massachusetts Bay, is occupied or being rapidly taken for this purpose; land, a few years since, that was considered of little value, now commands high prices; large and extensive hotels have been erected, or being erected, at prominent points for the accommodation of those who prefer this mode of life. As the country becomes more settled and the people acquire additional property, this custom will prevail, and the numbers that resort thither will annually be on the increase.

MR. JOHN H. SEARS, of Salem, exhibited the specimens of the following plants and flowers found during the morning ramble, and described the same.

Anemone Virginica, *L.*
Elodes Virginica, *Nutt.*
Spergularia salina, *Presl.*
Oenothera biennis, *L.*
Cephalanthus occidentalis, *L.*
Lobelia cardinalis, *L.*
Stachys palustris, *L.*
Datura stramonium, *L.*
Suædea maratima, *Dum.*
Zostera marina, *L.*
Cakile Americana, *Nutt.*
Spergularia rubra, *Presl.*
Silene inflata, *Smith.*
Solidago odora, *Ait.*
Xanthium strumarium, *L.*
Plantago maritima, *L.*
Convolvulus arvensis, *L.*
Salicornia herbacea, *L.*
Salsola kali, *L.*
Habenaria lacera, *R. Br.*
Habenaria psycodes, *Gray.*

Mr. Sears also made some appropriate remarks upon the troublesome weeds, so annoying to farmers.

HON. J. J. H. GREGORY, of Marblehead, was called

upon by the President, and spoke of the geological features of the Neck. He said that porphyry, syenite and greenstone were the principal formations, and, while porphyry was very abundant on the Neck, there were no specimens of it found in Marblehead proper. Some of the ledges showed very fine and handsome specimens of banded porphyry. Mr. Gregory spoke in a general way of the geology of the county and of the state, and said that there should be a full and complete collection of rocks and minerals of the state for preservation in the county, and suggested that the Institute would do well to take the initiative. It would be both valuable and interesting.

Along the shores of the Neck are found great quantities of porphyry chippings, so called; these were, without doubt, left by the Indians, who formerly roamed over the vicinity, and who made their cutting implements from porphyry, which is very hard; these Indians probably came to the ledges and chipped stone into the general shape of arrowheads, or other weapons, and carried them away to be finished at leisure. The speaker said that large quantities of these chippings could be found in various places along the shore. Mr. Gregory referred to the beautiful porphyry tables at the centennial exhibition in Philadelphia, which were highly polished, showing a remarkable finish and lustre. He had made experiments with the stone found here, but had been unable to produce the desired effect.

Mr. Gregory also alluded to the plants spoken of by Mr. Sears, saying he had been much troubled by the horsemint on his farms at Middleton.

Prof. Edward S. Morse was the next speaker. He referred to the plants and marine animals noticed during

his walk along the shores, and spoke of the habits of several of these animals, which showed a wonderful capacity for discovering localities fitted to their several conditions. He described in a most interesting manner the habits of the common ant, its methods of building, etc. He also said, that several southern forms of seaweed are now found in Gloucester, and that many of the mollusks and other species of animals, found along our seacoasts, were imported, coming in various ways from their original homes. In this connection he alluded to the remarkable rapidity in the diffusion of *Littorina littorea;* an interesting and valuable account is printed in the Bulletin of the Institute, and will be found on pages 171–176 of Vol. XII.

Hon. William D. Northend being called on by the President responded in a humorous vein,— remarking upon the work of the Institute, expressing his interest in the object, and extending a cordial welcome. He referred to the geological features of the Neck, and hoped that a systematic study of the rock formations would be made.

George M. Whipple, the Secretary of the Institute, offered the following resolution which was unanimously adopted.

*Resolved*, That the thanks of the Essex Institute be tendered to the Directors of the Marblehead Neck Association for the use of their hall, and to Frank R. Kimball, Esq., for many courtesies so pleasantly rendered, and for the use of his house for the lunch.

The Institute then adjourned, and the party returned to Salem by ferry and cars, at pleasure.

### Tuesday, August 16, 1881.

Meeting this day. The President in the chair. Records read.

Mr. George Sibley, of Salem, was duly elected a resident member.

### Wednesday, August 30, 1881.

The field meeting postponed from August the 18th and 19th, on account of the inclemency of the weather, was held this day at Saugus. The day was intensely hot, the thermometer being over 90° in the shade. The people of Saugus were very polite and attentive, and by their civilities rendered the day very enjoyable.

After depositing the baskets in the library room at the Town Hall, parties were improvised to visit the principal places of interest. The following may be specified: The Cinder Bank, the site of the old Iron Works, Appleton's Pulpit Rock, the Jasper Quarry, the cool retreat at the ancient homestead of the Hawkes family, the house of Mr. W. F. Hitchings, in which were found the Records of the Third Parish, Lynn, since incorporated as the town of Saugus, the first warrant granted by Hon. Ebenezer Burrill, dated March 5, 1738–9, to Joseph Haven, one of the proprietors of the meeting house in the westerly end of Lynn for holding the meeting for organization. June 9, 1739, Rev. Edward Cheever was chosen the first minister and was ordained Dec. 5, 1739. Rev. Joseph Roby accepted the call July 26, 1750, was the second minister. He continued the devoted pastor for more than half a century, his death occurring Jan'y 31, 1803,

in the eightieth year of his age and the fifty-first of his ministry in this parish. Many historical points of interest were found in these records, worthy of mention, if space would allow.

Lunch was served at 1.30 P. M., and the afternoon session was held at 3 o'clock, the President in the chair. Records of preceding meeting were read.

The PRESIDENT after a few remarks alluding to the kind courtesies extended to the Institute at a previous meeting held in this place, called upon Mr. John H. Sears to give some account of his findings during the forenoon ramble.

MR. SEARS said that Saugus was a remarkably fine field for the botanist, and that the fluviatile species of plants were well represented. He regretted that in consequence of the heat and want of time, he was unable to make a satisfactory examination of the flora. He, however, exhibited and described several specimens. The following may be specified:

1. Nymphæa odorata (*White Pond Lily*).
2. Polygala cruciata (*Milkwort*).
3. Amphicarpæa monoica (*Hog Pea Nut*).
4. Potentilla fruticosa (*Shrubby Cinquefoil*).
5. Eupatorium purpureum
6. Nabulus altissimus (*Rattlesnake root*).
7. Lobelia cardinalis (*Cardinal Flower*).
8. " inflata (*Indian Tobacco*).
9. Clethra alnifolia (*Sweet Pepper bush*).
10. Monotropa uniflora (*Indian Pipe*).
11. Gerardia purpurea (*Purple Gerardia*).
12. Chelone glabra (*Snake Head*).
13. Verbena hastata (*Blue Vervain*).
14. Cuscuta epilinum (*Flax Dodder*).
15. Phytolacca decandra (*Garget*).
16. Juglans nigra (*Black Walnut*). There are several fine speeimens of this tree in this town, the largest is on the land of Mr. Albert F. Parker, which measures eighteen feet in circumference at one foot above the ground, and

is seventy or eighty feet high, and produces an abundance of fine nuts. Mr. Parker has steps built up to the branches some fifteen feet above the ground, where there is a seat which looks as if it might be enjoyable.

17. Pontederia cordata (*Pickerel Weed*).
18. Scirpus eriophorum (*Wool Grass*). Specimens were quite conspicuous in the several collections of wild flowers gathered during the ramble.
19. Zizania aquatica (*Indian Rice*) was very luxuriant on the banks of the mill stream.
20. Muhlenbergia sylvatica (*Drop Seed Grass*) abundant in damp woods.
21. Lygodium palmatum (*Climbing Fern*). Locality doubtful.

Prof. Herbert B. Adams, of Johns Hopkins University, Baltimore, followed with the paper of the day — on the *Commons and Commoners of Salem* — commencing with the remark, that Salem Common and the Great Pastures of Salem are cases of historic survival. They are bits of fossil history linking the communal life of New England with the earliest beginnings of the Teutonic life. Salem, and all our towns are but the reproduction of the village community system of the ancient Germans, as described by Tacitus. He then gave a brief outline of this system which, he said, was brought over to this country by the invading Puritans, and was established at Salem in all its completeness. He then confined his remarks to the special subject, "the Commons and Commoners of Salem," or Naumkeag as it was first called, but afterwards took its present name to mark the era of peace to the infant settlement, chosen as the site of a plantation by Roger Conant and his companions. These pioneers came hither from Cape Ann, because of the inviting meadows and "the quantity of planting land," upon this "pleasant and beautiful peninsula environed by an arm of the sea on each side," as Hubbard says in his narrative, and laid the foundation of the village of Salem. He presented a

life-like picture of this early period, noticing the additions to the population, and the materials necessary to the use of the settlement, by the arrivals of Endicott, Higginson, Winthrop and others, tracing the various changes in this system of land tenure then held to the present time, as circumstances required, interspersed with brief sketches of the habits, customs and occupations of the people in the different periods.

It may be needless to particularize more fully the interesting and instructive communication of Professor Adams; it is intended to have the same printed in full in the Historical Collections of the Institute.

Dr. J. W. Goodell, of Lynn, brought to the meeting a curious old steam jack. This machine consists of an iron vessel from which the escaping steam acts upon the floats of a wheel, the power thus created was utilized in turning the spit which was placed before the fire upon hooks attached to the andirons, the same fire roasting the meat and generating the steam in the machine, patented by John Bailey, of Lynn, in 1795.

Mr. E. P. Robinson, of Saugus, was then called upon to give some account of the early and local history of Saugus. After speaking of the "Hawkes' Homestead" and the very notable gathering there in July, 1880, when a reunion was held at the 250th anniversary of the family, which embraced persons of the name from very many states in the Union, bringing together divines, lawyers, poets, editors, generals, farmers, artizans, etc., he proceeded to give an account of the Saugus "Iron Works," the first in the country, and where the die was struck which coined the first "Pine Tree shilling" of Massachusetts, by Joseph Jenks. He also described "Pulpit Rock"

and the Cate mount, and gave the legend of that somewhat noted locality, which became the property, afterward, of Samuel Appleton. He also gave the inscription recently placed upon the rock, on a copper tablet, bolted securely on to the rock, reading as follows: "Appleton's Pulpit. In Sept., 1687, from this rock tradition asserts that, resisting the tyranny of Sir Edmund Andros, Major Samuel Appleton of Ipswich spoke to the people in behalf of those principles, which later were embodied in the Declaration of Independence." He also gave a brief account of the seminary, dedicated in 1821, Rev. Joseph Emerson, Principal, and alluded to several scholars who have since been noted in the fields of literature. He then considerd some of the Saugus worthies of the past, Zaccheus Stocker, Dr. Abija Cheever, Benj. F. Newhall and others, touching upon their salient points. He paid an appropriate tribute to George William Phillips, a graduate of Harvard in 1829, and concluded with glancing at the representative men of the present day, now in the active duties of life.

Dr. George A. Perkins, of Salem, presented the following vote, which was unanimously passed.

*Voted*, That the thanks of the Essex Institute be tendered to the people of Saugus for their kind and lavish attentions during the day. To the Selectmen for the use of the Town Hall. To the ladies for services and for refreshments furnished. Especially is the society indebted to Mr. E. P. Robinson, Mr. A. A. Scott, the Misses Scott, Mrs. C. Wilson, Mrs. O. M. and W. F. Hitchings, Mrs. D. Cheever and Miss Jackson, for many courtesies.

Dr. Perkins also embodied in his motion, the thanks of the Institute to Professor Adams for his very able and instructive paper. Meeting adjourned at 5 P. M.

# BULLETIN

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## FIELD MEETING IN BOXFORD, SATURDAY, OCT. 8, 1881.

SEVERAL members of the Essex Institute and their friends visited Boxford, this day, by invitation of the Boxford Natural History Society,[1] of which Rev. Wm. P. Alcott is President, and Mr. Sidney Perley, Secretary. The Institute party reached the First Parish Church about 11.30 A. M., after a pleasant drive along the ancient roads and by-ways, which are bordered here and there by the loose stone walls or brush fences, with growths of bushes and trees; occasionally passing the quiet homes of the farmer, consisting in many cases of an old fashioned house and barn, irregularly located out-buildings, and the open well with the sweep and the oaken bucket, recalling the scenes of days long past. The inquiry is suggested in passing, who were and who now are the occupants and what have been their experiences in their seemingly quiet lives. In some of these old homesteads of the early settlers successive generations of their descendants have passed their lives from infancy to old age.

A delegation of the Boxford society was at the church

[1]Appended to this report is a notice of this society, communicated by Mr. Sidney Perley.

and received the party on arrival. After depositing the baskets, the time previous to lunch was occupied by a ramble through the fields and woods. The rich bloom of vegetation was past, a few autumnal flowers yet lingered, and the dry and withered leaves as they fell to the ground indicated that summer was ended and that the winter was near.

After partaking of a lunch in the basement of the church, the afternoon session was held in an adjoining room. The Rev. W. P. Alcott, in the chair, extended a cordial welcome and said that such visits from the older societies would do much to stimulate those that are recently formed, to increased efforts in the cause of science. He exhibited a fine collection of plants prepared by himself; several of these were found in the refuse heaps of a woollen mill — the seed undoubtedly imported with the wool, finding a lodgment in the bales during the process of packing. Several quite rare plants, of foreign origin, have thus been detected and have become naturalized.

Since the meeting Mr. Alcott has prepared a list of the plants exhibited with accompanying notes, and it is appended to the report of this meeting.

Mr. Alcott then called upon Mr. John Robinson, of Salem, who read a very interesting paper entitled "A Study of Botany in Essex County," alluding briefly to those plants that characterize our local flora, spoke of the condition of botanical science during the time of Rev. Dr. M. Cutler, when he was the devoted minister at the Hamlet church in Ipswich, now Hamilton, during the latter part of the last and the beginning of the present centuries, devoting much attention to scientific pursuits, and may be considered the pioneer botanist of Essex. Brief sketches were given of Dr. George Osgood, Dr. Andrew Nichols, Dr. Charles Pickering, William Oakes, John

Lewis Russell and others, who were worthy to follow in the footsteps of Cutler.

Henry Wheatland, being called upon, spoke of the pleasure he had received from the gathering this day, and said it was part of the work of the Institute to aid all kindred societies in the performance of the work of their organization. He extended a cordial invitation to the Boxford Society to visit Salem at such times as may be agreeable and convenient to them.

Mr. George M. Whipple proposed that the thanks of the Institute be tendered to the Boxford Society of Natural History for the courtesies extended during the pleasant visit to Boxford this day, and especially to Rev. Mr. Alcott, Mr. Sidney Perley, Mrs. M. P. Perley, Miss Mary E. Perley, Miss Hattie E. Parkhurst, Miss Lizzie M. Frye, Mr. Lawson B. Twitchell, and others. Unanimously adopted. Voted to adjourn.

The society before returning to Salem visited the Match Factory, one of the institutions of Boxford. The total number of hands employed is twenty-seven, and the present season is the busiest the place has ever known. The company which runs the mill is the Diamond Match Company. Only the sawing and preparing of the wood is done in Boxford, the "dipping" process being done at the company's works on Pearl street, in Boston. Mr. John Parkhurst, to whom we are indebted for the facts in this sketch, has occupied the office of superintendent of the mill for about thirteen years. The place has, we believe, been in operation as a match factory some fifteen years, and previous to the establishment of the present industry, the manufacture of cotton batting and wicking was carried on, while the original use of the establish-

ment was for a grist mill. The operation by which a log comes into the mill in a rough state, and goes out cut up into many thousand cards of matches, is a very interesting one. First the log (nothing but white pine is used) is hauled into the mill and cut up by two large circular saws into various lengths, care being taken to remove the knotty and defective portions of the logs. These sections are then passed through other saws which cut them up into pieces a little thicker than a card of matches, and trim off the rough edges. These boards are then put into iron tanks, where they are steamed for two hours, for the purpose of taking out the pitch, and facilitating the cutting. After taking the wood out of the tanks it is cut up into strips having the same thickness as a match, by a rapidly working knife, driven by power. The wood is now cut into strips of various lengths but having the width and thickness of a card of matches. The wood is then pressed together in racks and put into drying rooms, where the temperature is constantly kept up to 160 or 170 degrees day and night, through the drying process, which lasts about a week. When the wood has become sufficiently seasoned it is taken into the "gauging room," where workmen thrust a bunch of the strips into a box containing a number of revolving saws which cut the slits between the matches. Then by the aid of another saw and gauge the cards are cut off from the strips and the operation is completed.

The wood used by the mill is all obtained within a radius of three or four miles, and notwithstanding some 2,000 tons of timber are sawed up annually, it seems as though Boxford might stand the drain for many years to come. Much of the rough timber which comes to the mill is used in the manufacture of boxes in which the matches are packed and shipped. When this factory was first started it was believed that the water-power would be suffi-

cient for all purposes; but it was afterwards found necessary to put in a fifty or sixty horse-power engine, which is now used in connection with the water-power — the latter being estimated at about fifty horse-power. Wood is used altogether for fuel in the boiler, the refuse pieces and trimmings from the mill supplying most of the demand. The fireman is kept constantly busy feeding the fires. A new process is being introduced into the mill for drying the wood after it has been steamed, by which a draft of hot air will be passed through a heater, containing a mass of 1,350 feet of inch piping and weighing nearly two tons, and then through the drying rooms.

### NOTICE OF THE BOXFORD NATURAL HISTORY SOCIETY.

A few persons interested in the study of natural history met at the house of Mrs. Mary P. Perley, May 28, 1881, and organized this association. Sidney Perley was chosen chairman, and Miss Mary E. Perley, secretary. A committee was chosen to draft a constitution, which was adopted by the society, June 21. Under the constitution the officers are chosen semi-annually — at the first regular meetings in January and July. The first election of officers was held June 21, and the following was the result:—President, William P. Alcott; Vice President, Miss Mary E. Perley; Secretary, Sidney Perley; Treasurer, Miss Hattie E. Parkhurst; Curator, Frank L. Parkhurst; Executive Committee, F. L. Parkhurst, S. Perley, and Miss M. E. Perley. The regular meetings are held on the second and fourth Tuesday evenings in each month. The society had eight charter members, and at present (Dec. 16, 1881), has twenty-four regular and two honorary members. They are gathering a museum, and a library of books treating upon subjects pertaining to natural history.

# INTRODUCED PLANTS FOUND IN THE VICINITY OF A WOOL-SCOURING ESTABLISHMENT.

BY WILLIAM P. ALCOTT.

Among agencies which affect the distribution of vegetable life, sheep are an important factor. Brushing amidst low vegetation, their fleece lays hold of all seeds and seed vessels which are not perfectly smooth. These seeds, becoming tangled among the filaments and often working their way deep into the fleece, may be carried wherever sheep are introduced or wool is manufactured into cloth.

We occasionally receive into our mills, wool from Australia, the Cape of Good Hope, Asia Minor, Spain and other countries of the Old World, as well as from various parts of South America and from some of the islands of the Pacific. Our New England factories draw their supplies, in considerable part, from the states of the interior, from the territories west of the Mississippi, and from the Pacific coast; and American flocks are continually maintained and improved by importations from the other great sheep-raising countries of the world. All this involves the scattering of seeds from every region where sheep flourish. It may be expected that many of the plants which grow where these animals can live upon *other* continents, will grow where they can live upon *our own* continent. Some perhaps may enter our milder sections, by way of the cooler, and some the cooler, by way of the milder, while others may be unable to adapt themselves to more than a very limited portion of our national domain.

Of these suggestions, the following list is an illustration:

In a village near Lowell — North Chelmsford, Middlesex Co., Mass. — is a wool-scouring establishment. Hither are sent, for cleansing, bales of fleece from many regions of the world, but mostly from California. That which comes from the latter country is peculiarly "*shivey*,' or full of seeds and other foreign substances. The dirt, which is blown or washed from the wool is thrown into pits and the foul suds are pumped upon the mass which is thus converted into manure. The solid refuse, in this way utilized, consists largely of two kinds of burs which have become so familiar to "wool-scourers" as to obtain technical names, the burs of Xanthium strumarium being called "*nestizoes*," and the spiral pods of Medicago denticulata, "*alfaquas*." Along with these are many other kinds of seeds, all of which are more or less concealed in the fuzzy masses of refuse. In the process of dumping this waste into the pits, these seed masses are somewhat scattered, as they also are by the wind and other agencies. Many germs, too, survive in the manure.

The writer resided in North Chelmsford from 1878 to 1880, but most of the following plants were collected during the summer of 1878 when his daily walk to the post office took him through this botanic garden. Previous to that season, a piece of ground around the pits had been manured heavily with this compost and "seeded down" to grass. This land produced quite abundantly many of the following plants, especially the Borraginaceæ, Compositæ, Grassès, and Erodium cicutarium. Business being dull that summer and the weather being favorable, the edges of the pits produced certain species more abundantly than either subsequent summer.

The soil of the village is a sand which becomes very hot and dry under a summer sun, and may afford special Californian conditions.

In the list there are thirty-six species, representing twenty-nine genera and fourteen orders. A professional botanist might doubtless have obtained a larger list. One of these plants (Microseris Douglasii, *Gray*), never refound since its discovery nearly fifty years ago, turns up here in eastern Massachusetts! Some unknown sheep certainly deserves botanical honors!

Most of these plants were identified by Sereno Watson, Ph. D.; also to Mr. L. J. Hastings, of North Chelmsford, special acknowledgments for assistance are due.

A few of the species in the following list grow in New England and even in Middlesex county. But none of them are found in the immediate vicinity under consideration, and there can be no question that all below were sown by wool; and that, whatever be their original *habitat* they came to this locality, with possibly an exception or two, *via* California, whence is received seven-eighths of the wool "handled" and where nearly every plant mentioned has been recorded as growing. In the list, special scarcity or abundance is noted.

CRUCIFERÆ.

1. Sisymbrium incisum, *Engel.*
2. Tropidocarpum gracile, *Hook.*

GERANIACEÆ.

3. Erodium cicutarium, *L'Her.*
   Abundant and spreading. This plant seems to be a native of the Pacific coast of both Americas, but may have found its way thither from Europe, which has been considered its home. It grows about woollen mills in New England, and is occasionally found in New York and Pennsylvania. The twisted and bearded styles greatly favor the dispersion of its seeds by the fleeces of sheep.

LEGUMINOSÆ.

4. Medicago denticulata, *Wild.*
   Eastern States; adventive from Europe.

5. Medicago minima, *L.*
   Not mentioned among California plants, but probably growing there. As a plant of Southern Europe and Oriental Asia, it may possibly have reached our locality with Turkish wool.
6. Trifolium Macræi, *H. & A.*

ONAGRACEÆ.

7. Clarkia rhomboidea, *Dougl.*
8. Œnothera bistorta, *Nutt.*
   Abundant.
   Œnothera bistorta, *Nutt.*, var. Veitchiana, *Hook.*
   Rare.

COMPOSITÆ.

9. Bæria tenerrima, *Gray.*
10. Bæria uliginosa, *Gray.*
11. Chænactis glabriuscula, *D. C.*
12. Hemigonia ramosissima, *Benth.*
13. Hypochæris glabra, *L.*
14. Layia platyglossa, *Gray.*
    Much at home. Having a prettily colored daisy-like flower.
15. Matricaria discoidea, *D. C.*
    "Apparently indigenous on the Pacific coast."
    "Established in Northern Europe."
16. Microseris Douglasii, *Gray.*
    Concerning this plant, Dr. Watson wrote me in 1879: "A very rare species having been collected only by Douglas himself, over forty years ago."
17. Xanthium spinosum, *L.*
    "Introduced from Chili" into California, doubtless by sheep. Tropical America and Southeastern United States.
18. Xanthium strumarium, *L.*
    Originally from Europe. Occasionally found in Eastern Massachusetts.

SCROPHULARIACEÆ.

19. Mimulus brevipes, *Benth.*
20. Orthocarpus purpurascens, *Benth.*

LABIATÆ.

21. Marrubium vulgare, *L.*
    From Europe.

BORRAGINACEÆ.

22. Amsinckia spectabilis, *F. & M.*
    Very abundant.

23. Echinospermum Lappula, *Lehm.*
Scarce. Found in New England. From Europe.
24. Eritrichium oxycaryum, *Gray.*
Very abundant.

HYDROPHYLLACEÆ.

25. Phacelia brachyloba, *Gray.*
26. " circinata, *Jacq.*
27. " tanacetifolia, *Benth.*
28. " Whitlavia, *Gray.*
Abundant; showy flowers; well known as a garden annual.

POLEMONIACEÆ.

29. Gilia inconspicua, *Dougl.*
30. " leucocephala, *Gray.*
Both scarce.

SOLANACEÆ.

31. Nicotiana Bigelovii, *Watson.*
Single specimen found.

CHENOPODIACEÆ.

32. Atriplex bracheosa, *Watson.*

POLYGONACEÆ.

33. Chorizanthe pungens, *Benth.*
Single specimen.

GRAMINEÆ.

34. Festuca myurus, *L.*
Europe; Middle and Southern States.
35. Hordeum murinum, *L.*
Europe.
36. Polypogon Monspeliensis, *Desf.*
Europe. One locality in New England and Southern States.

## Excursion to Chelsea, Friday, October 14, 1881.

A party of the members of the Institute, with friends, numbering seventy-seven persons, left Salem, at noon, over the Eastern Railroad. On arrival at Chelsea, special horse cars conveyed the party to the Art Tile Works of the Messrs. Low, on Broadway (formerly known as the Salem

Turnpike), about a mile distant. At this place, the operation of tile-making was observed and rendered very interesting by the explanations of Mr. J. G. Low. These works are now filling orders from the proprietors of the large hotels, private residences and public buildings, for the beautiful decorative tiles, which are fully equal to those of foreign manufacture in richness of design. The demand is also becoming extensive, as the tiles are largely used by the furniture and stove manufacturers. The operation of glazing and coloring was found especially interesting, many of the figures being elaborate and well executed.

The party then proceeded to the works of the McGee Furnace Company, where the great variety of castings, from stoves and stove fittings to fine metallic vases, shields, helmets and wall decorations, were examined and admired. Several gentlemen of the concern were very polite and courteous and conducted the party through the various departments.

At 4 P. M. the afternoon session was held in the rooms of the Chelsea Review Club on Broadway. The President in the chair.

The PRESIDENT, after a few brief remarks, called upon Mr. J. G. LOW, who gave a description of the Tile Factory, how it was commenced, and its progress to the present time.

Prof. EDWARD S. MORSE followed Mr. Low and gave an account of the Japanese pottery, describing the methods adopted from an early period to the present time, and also the peculiarities in the manufacture of the different varieties, accompanying his remarks with allusions to some of the social and domestic habits of the Japanese.

Vice President F. W. PUTNAM exhibited some specimens

of early American pottery and gave a description of the various modes of its manufacture by the different peoples in America. He showed how the ancient pottery had been made over round stones, in some instances, while in others it was formed by coiling ropes of clay upon themselves, and in still others by casting in moulds. He then explained how his studies of the pottery of past times, and that made by the uncivilized peoples of the present time, were not at all from the standpoint of the artist, but purely from that of the ethnologist. He then called attention to the different ways of preparing and mixing the clay by various American tribes and nations, and to the distinct forms and methods of ornamentation adopted. Stating that from a study of these methods we could soon learn to distinguish the various types found in America, and by following out the particular development of the art in various places in North, Central and South America, we could draw important conclusions relating to the migrations of nations and their contact with each other.

Rev. Fielder Israel, of Salem, offered the following vote of thanks which was unanimously passed:

*Voted*, That the very cordial thanks of the Essex Institute are hereby tendered to the Messrs. Low of the Chelsea Art Tile works, Mr. J. R. Carr of Chelsea and the proprietors of the McGee Furnace Company for many civilities and attentions during the day, and to the Chelsea Review Club for the use of its rooms for this meeting.

Regular Meeting, Monday, November 7, 1881.

At the meeting this evening Messrs. George Plumer Smith of Philadelphia, Pa., and William W. Wheildon of Concord, Mass., were elected corresponding members.

REGULAR MEETING, TUESDAY, NOVEMBER 22, 1881.

AT the meeting this evening, adjourned from Monday 21st, Miss Haskell Moulton Nichols of Salem was elected a resident member.

The President read a communication from the Historical Society of Prince Edward Island.

Referred to Robert S. Rantoul, Esq., who was requested to reply to the communication expressing to the society the good wishes and the coöperation of the Institute.

Charlottetown, Prince Edward Island,
17 November, 1881.

To the Corresponding Secretary Essex Institute,
Salem, Mass.

SIR:

A public meeting was held here on the 12th September last, for the purpose of establishing an Historical Society for Prince Edward Island, a report whereof I beg to forward you herewith.

Under instructions from the Executive Committee of that Society, I take the liberty of addressing you to solicit on their behalf any books, pamphlets, or papers, or any information you may see fit to furnish us, calculated to assist us in our work, and we shall be glad to reciprocate any favors of this nature we may receive by sending you other books in return, and by communicating any information which may be of service to you at our command.

The early history of our Province is in some measure connected with the history of the United States, in their struggle for independence. During the Revolutionary war two American armed vessels from Marblehead were commissioned by Congress in 1775, to cruise in the Gulf

of St. Lawrence, for the purpose of intercepting some ordnance store ships, then supposed to be on their way to Quebec. Having failed in that object, they paid Charlottetown a hostile visit, where their crews landed and carried off as prisoners, Mr. Callbeck, the President of Council and Attorney General — then acting as Administrator of the Government in the absence of the Governor — and two other officers of government. These gentlemen were taken before General Washington at his camp at Cambridge, who ordered their release and the restoration of all the property taken when they were captured. In doing so he expressed his regret for their capture, and Mr. Callbeck bears testimony to his courtesy to the prisoners in a letter of thanks to be found in Irving's Life of Washington.

Some of the Public Records of the Colony were carried away at the same time, which have never since been returned. We would be glad to recover these records or obtain copies of them, if they are still in existence.

Our second Governor, General Edmund Fanning, was, during the war, a colonel in the King's American Regiment and received his appointment as Governor in acknowledgment of services claimed to have been rendered by him to the Royalist Cause in North Carolina and afterwards in New York, under Governor Tryon. He is the subject of frequent allusion in Bancroft's History.

The facts in our possession relating to the capture and release of Mr. Callbeck and the other government officials are somewhat meagre, and we shall be pleased to receive any information within your reach bearing on this subject, or on any other of an historical character which you may see fit to furnish us.

I remain, sir,
Yours respectfully,
GEORGE ALLEY.

Rooms of the Essex Institute,
Salem, Mass.,
November 22, 1881.

To the Hon. George Alley,
In behalf of the Historical Society for
Prince Edward Island.

Sir:

The Essex Institute, located at Salem in the County of Essex and Commonwealth of Massachusetts, met at Salem, November 22nd, and received and considered with much pleasure, your communication of the 17th instant. The undersigned was instructed to express, in return, the sentiments of the Institute.

It is with no ordinary gratification that we are able to greet and welcome one more member to the growing sisterhood of the Historical Societies of America. And if we can be of service in any way, either through an exchange of publications or otherwise, in furthering the noble objects of your research, or the general cause of fraternity among men and peoples, and especially in contributing to the culture and happiness of the people of your beautiful Island, it will give us great pleasure.

In this I speak the sense of every associate of this elder Society, and will add that we shall be especially happy if our contiguity to the town of Marblehead may possibly lead us to some discoveries bearing directly upon the points raised in your letter.

I am, sir,
In behalf of the Essex Institute,
Yours very respectfully,
Robert S. Rantoul.

The Secretary, in announcing the donations, particularized several interesting manuscripts that had recently

been received from Rev. George B. Jewett, being a portion of the papers left by his grandfather, the late John Punchard, who, during the early part of this century, was very prominent in our local affairs and in the church then under the ministry of the Rev. Drs. Worcester, father and son, and of the Rev. Drs. Elias Cornelius and John P. Cleaveland.

The SECRETARY also alluded to a donation from Rev. Benjamin Knight of several old English bricks, taken from the old Prince house now in the process of demolition. This ancient house, located on the corner of Pleasant and Forrester streets, was built about 1670 (the original town grant of land being made at that time), by Richard Prince for his son Joseph. The latter, dying unmarried, bequeathed it to his brother Richard, and it has been successively owned by descendants from that time to a recent period, the Princes, the Mascols and the Knights. This was one of the first houses built on the range of grants from the present Franklin building to the water eastward. There was a long tradition that it was built of wood from trees cut upon the common. This may not necessarily imply on what is now known as the common. The term "commons" was frequently applied to the common lands, of which there were large tracts in various parts of the town.

Richard Prince, Sen.,[1] was born about 1614, died July, 1675. His name appears frequently in the records, thirty acres granted 23, 10, 1638. His eldest son Joseph born 10, 7, 1643; died, probably unmarried, November, 1677. Richard, Jr., baptized 18, 1, 1655; died September,

[1] For a notice of Richard Prince of Salem and some of his descendants, by James A. Emmerton, M. D., see Historical Collections of Essex Institute, Vol. XIV, page 249.

1702; went to the Narragansett fight in 1675, probably in the company of his neighbor Capt. Joseph Gardner.

REGULAR MEETING, MONDAY, DECEMBER 19, 1881.

MEETING this evening. The PRESIDENT in the chair. Correspondence and donations announced.

Messrs. N. F. Merrill and Edward L. Rogers were elected resident members; also Miss Louisa Huntington, all of Salem.

*Voted*, That the President, Treasurer, and Robert S. Rantoul be a committee of the Institute to procure, if possible, from the Legislature, at its coming session, an amendment of the Charter which shall authorize the holding by the Essex Institute of personal property to the amount of ($100,000) one hundred thousand dollars, instead of twenty thousand dollars.

JOHN H. SEARS presented the following communication, which, according to the rules, was referred to the publication committee: accompanying the presentation of this communication, Mr. Sears gave a very interesting account of his collectings through Northern New York, embracing the well known Adirondack region, which is a favorite resort for the sportsman, and the lover of beautiful and varied natural scenery, with brief descriptions of the country, its mountains, its rivers, its lakes and its flora, more especially the trees and the shrubs.

# NOTES ON THE FOREST TREES OF ESSEX, CLINTON AND FRANKLIN COUNTIES, NEW YORK.[1]

BY JOHN H. SEARS.

These notes give the age, size and general locality not only of the specimens that were collected but of some of the largest trees that were found, many of which are rare even in those forests, and which, except during the winter months, cannot be cut and removed. It is much to be regretted that these forest monarchs will soon be known only in the traditions of the past. Essex Co., Mass., during the earlier part of this century, probably possessed similar forest trees, and we can by these notes form some idea of what might then have been collected in this vicinity. In making this collection for the museum, it was desired that I should obtain as large a trunk specimen of each species as could be found or was practicable to obtain. The notes are arranged in the botanical order of the trees.

Tilia americana (*Basswood*). This is one of the largest forest trees. The one that was cut was 80 feet long: it stood in a grove of second growth maples that were probably 50 or 60 feet high.

This tree was so much taller that it was conspicuous for several miles; it was 4 feet in diameter and was thirty feet to the first limb. This tree and three others of nearly the same size which we began to cut were partially decayed. The largest sound tree that I could find was 2 feet 8 inches in diameter, and on the stump from which this tree was cut 194 annual circles of growth were counted. Allowing that the annual growth is about one-sixth of an

[1] Taken while collecting wood specimens for the American Museum of Natural History at Central Park, New York, during the months of September and October, 1881.

inch, the tree 4 feet in diameter would have been 288 years old.

ACER SACCHARINUM (*Sugar Maple*) grows to a larger size in Clinton county than in any other part of the state of New York.

On the foot-hills near Lyon Mt. and in Ellenburgh it is one of the principal hard wood forest trees. The forests in this section are the most extensive and most natural I ever saw. I have walked hour after hour in some of these grand old woods looking for different kinds of trees without seeing anything that would lead me to think I was not the first man to walk there with an axe: not a stump was to be seen, nor were any of the trees blazed or chipped, but all was one primitive forest. In such fine old woods as these the maple grows to a size not to be found elsewhere. One tree 12 feet in circumference was cut into and as nearly as one could judge it was 80 feet high, but after chopping three or four hours it was found to be decayed in the centre. Later, one tree 3 feet 6 inches in diameter and another 3 feet, were cut with the same results, so it was necessary to take a smaller tree.

The tree 3 feet 6 inches in diameter had 300 annual circles of growth: probably the trees 12 feet in circumference are over 400 years old as after the heart wood begins to decay the tree would naturally make a smaller annual growth. Trees of this species decay from the branches down, which is not the case with most other species of trees.

ACER PENNSYLVANICA, called *Whistle-wood* in New York, *Striped Maple* in Massachusetts, is very common in all parts of the state: it is seldom over 5 inches in diameter and 25 feet high.

ACER SPICATUM (*Mountain Maple*), like the last, is very abundant: a specimen 7 inches in diameter was collected.

It grows to about the same height as the Acer Pennsylvanica and in similar situations; the foliage is remarkable in autumn for its beautiful color.

Acer rubrum (*Red Maple*) is a rare tree in northern New York; the largest trees that were found were 18 inches in diameter and 30 or 40 feet high.

Acer dasycarpum (*White Maple*) is more abundant. One tree was measured that was 9 feet in circumference and 60 or 70 feet high.

Negundo aceroides grows equally large as far north as Montreal. Some of the trees that were found were 30 inches in circumference and 30 feet high.

Prunus pennsylvanica (*Pin Cherry*) is a small tree, and a specimen 15 inches in diameter and 30 feet high was the largest found; it had 67 circles of growth which proves it to be a fast growing tree and short-lived. It is everywhere abundant.

Prunus serotina (*Black Cherry*), in a section between Altona and West Chazy, often grows to be 3 feet in circumference and 60 or 70 feet high. On the end of one log 3 feet in diameter I counted 370 circles of growth; from 70 to 100 circles the growth was so slight that it was necessary to place pins every 3 or 4 circles to mark where I had counted and from 180 to 250 they were quite as close together.

Pyrus americana and Pyrus sambucifolia are the next trees in order. Specimens were found, four or five growing on the same clump as is the case with alders, good specimens of both species, but in no case did I find the leaflets differing in shape more doubly serrate as they should be on trees bearing the larger berries than could be found on some of the trees with small berries. The petioles and rachises were of a deep red on all the trees that were examined; and as to the leaves being bright green on both

sides on one tree and pale on the under side of the other, I could detect no such differences, but concluded that good typical specimens of both species could be collected from the same tree.

FRAXINUS AMERICANA (*White Ash*) is a fine timber tree growing to a height of 60 or 70 feet without a limb, and with a diameter of 2 feet and holding this size for 30 feet. Of course, such trees are found only in deep forests where they are surrounded by other tall trees.

FRAXINUS SAMBUCIFOLIA (*Black Ash*) grows equally large. Near Schuyler Falls, growths of these trees were seen several hundred in number and nearly all 6 feet in circumference.

FRAXINUS PUBESCENS (*Red Ash*) is a scarcer tree; the only locality where it was found in abundance was on the shore of Moon Lake in Ellenburgh where it grows larger than either of the other species of Ash.

One of the trees measured was 9 feet in circumference, Another which was cut was 2½ feet in diameter and 100 circles of annual growth were counted on the end of the log.

ULMUS AMERICANA (*Common Elm*) is abundant, and with few exceptions is seldom over 2 feet in diameter but it is often 80 feet in height. On the side of one of the foot hills near Lyon Mt., a tree was measured that was 21 feet in circumference at 7 feet above the ground: it was 40 feet to the first limb and as near as could be judged was 100 feet high. It is so situated that it can be seen from five different townships though it is nearly surrounded by mountains. The owner of the land offered the tree for the Museum but it could not be cut and teamed excepting in the winter as there was much swamp land surrounding it.

CRATÆGUS COCCINEA (*Scarlet fruited Thorn*) is very

common on Cumberland Head, often assuming tree-like proportions; one was measured which was 40 inches in circumference with a head like an apple tree.

This tree was 20 feet high and completely covered with fruit but was partially dead on one side of the trunk. One tree was cut, which was 10 inches in diameter, it was 10 feet to the first limb, 25 feet high and had 80 circles of growth.

JUGLANS CINEREA (*Butternut*) is very abundant near Schuyler's Falls. Two trees that we measured there, growing on the edge of a maple growth were respectively 12 feet 6 inches, and 12 feet in circumference, but the trunks of these trees were hollow. The tree which was cut was 2 feet 8 inches in diameter, and had 180 circles of growth. The nuts from this tree were so much larger than is usual that some were collected for preservation. They were 4 inches long and 6 inches in circumference; the outer covering was of the usual thickness but the hard shell was of double thickness. The seed was small and inferior.

JUGLANS NIGRA (*Black Walnut*) is rare in Clinton county. The only place where this tree was found growing was near Salmon river, West Plattsburg; there most of the trees were partially decayed and the trunks twisted and crooked. The largest of them was not over 18 inches in diameter and 40 feet high.

CARYA AMARA (*Bitter-nut Hickory*) is very common all over Essex and Clinton counties. It is a beautiful tree often 2 feet in diameter, 50 to 60 feet in height with a large drooping head. Its delicate foliage gives it a beautiful appearance, and its size and shape were so different from trees of the same species found in eastern Massachusetts that it was the cause of much surprise to me. One reason that these trees are so large and thrifty is, that they

are perfectly free from the black wart which so disfigures this tree in eastern Massachusetts, nor were the leaves eaten by insects.

A few specimens of CARYA ALBA (*Square-nut Hickory*) were found on Cumberland Head, but it is supposed they were planted there as no trees of this species were found in the woods or surrounding forests.

QUERCUS BICOLOR, commonly called *Swamp White Oak*, is the principal oak. We cut one tree that measured 2 feet in diameter. It is a low tree, seldom over 40 feet in height.

QUERCUS ALBA (*White Oak*) is rare; all the trees noticed were on a ridge near Morrisonville, thirteen in number and none of them were over 8 inches in diameter and 30 feet in height.

QUERCUS RUBRA (*Red Oak*) is abundant in the southern part of Clinton county.

In Keeseville and in Peru it is a tall, slim growing tree seldom over 15 inches in diameter, but averaging about 70 feet in height.

FAGUS FERRUGINEA (*Beech*) grows in its most luxuriant form in Ellenburgh. Several beech trees were measured that were 12 feet in circumference and 80 or 90 feet high, smooth and straight, but all such old trees are partially decayed; this was the case with three different trees nearly this size which were cut. We finally cut one that was 3 feet in diameter and by cutting it a second time above, we secured a specimen 2 feet 8 inches in diameter: on the end of this specimen 290 annual circles of growth were counted; accordingly the largest trees (those 12 feet in circumference) would be 400 years old.

OSTRYA VIRGINICA (*Hop Hornbean*) is common in all parts of Clinton county, but it is seldom more than 6 inches in diameter, and 25 feet high.

Carpinus caroliniana (*Blue Beech*) is not so common but grows larger: a specimen was cut which was 10 inches in diameter and 5 feet long.

Cetula lenta (*Black Birch*) is rare. Among a few trees in Belmont, one was cut from which was obtained a specimen 2 feet 4 inches in diameter, 5 feet long. The wood of this tree is very fine grained, dark colored and very heavy: it is good timber for cabinet work, is remarkably stringy and very hard to split.

Betula lutea (*Yellow Birch*) is one of the largest trees in the forests of Ellenburgh, Altona and Champlain townships. The first tree of this species which was cut was 14 feet, 7 inches in circumference; 12 inches in the centre were hollow. Seven others nearly the same size were cut into, but they were all partially decayed.

The one from which a specimen was taken was 3 feet in diameter and on the end of the log 300 circles of growth were counted. The heart wood was as dark as Black Cherry and quite as hard. These trees are often 70 feet high and 50 feet to the branches; they make little or no new growth on the ends of the branches, consequently they have very few leaves.

Betula papyracea (*Canoe Birch*) is equally abundant near Malone, Belmont and Chateaugay, growing near streams and in lowlands. The largest one found was 6 feet 7 inches in circumference: as we could not get permission to cut this tree, it was necessary to get a smaller one, which was 5 feet 11 inches in circumference, and on which were counted 180 annual circles of growth. This is a large size for this tree as 18 inches is the largest diameter usually found and the bark is so much used by wood-cutters for drinking cups, and parties of Canadian Indians for baskets, that it is seldom one can find a perfect tree.

SALIX NIGRA (*Black Willow*) grows very abundantly on the borders of Saranac river near Schuyler Falls. There is a continuous line of these trees for several miles in some places completely overarching the river and making a perfect shade. Some of the largest of these trees were measured—one was 10 feet in circumference, several were over 9 feet and 60 to 70 feet in height. Nearly all leaned over the water. These trees were decayed in the centre; indeed, there were so many either crooked or decayed that it seemed doubtful if a perfect specimen could be found. Forty trees were cut into and finally one was found 18 inches in diameter. One curious fact concerning these trees, is that there were no dead limbs or knot-holes for water to enter, yet they were wet and soggy the whole length of the trunk inside of the sap wood.

SALIX DISCOLOR (*Glaucous Willow*) is common in all low grounds. In Ellenburgh it grows to quite a tree in some situations. One tree in a quaking bog, on the border of Moon Lake, was 40 inches in circumference; there was so much risk incurred in walking in this bog that it was impossible to get this specimen. One was obtained, however, which was 12 inches in diameter and had 90 circles of growth.

POPULUS BALSAMIFERA (*Balsam Poplar*) is a large timber tree in Ellenburgh; it grows in all parts of Clinton county, but only in Ellenburgh to this size. Its foliage varies very much in different localities: in deep forests the leaves are ovate, taper-pointed, serrate smooth on both sides; on open, rocky hill-sides the leaves are broader and somewhat heart-shaped; and in young growths among maples, perhaps thirty years old, specimens were found whose leaves were exactly like forms of P. balsamifera and also the var. Candicans besides many other variations, including one, the leaves of which were ovate, obtuse, en-

tire whitish on the under side, the leaves as well as the buds giving off the peculiar fragrance of this tree.

Populus heterophylla (*Downy Poplar*) is very common near Point of Rush, and on Block Island, Lake Champlain; it is a small tree 18 or 20 inches in diameter, 40 feet high.

Populus monilifera (*Cotton-wood*) grows near Keeseville, Port Henry and Peru, and there is one in a piece of woods near Peru village 15 feet in circumference and 80 feet high. One that was cut and left lying on the ground measured 70 feet in length and 3 feet in diameter without the bark. This tree or log had 184 annual circles of growth: to estimate within bounds the larger tree which was left standing must be three hundred years old.

Populus angulata (*Angled Cotton-wood*) is very common on the Vermont shore of the lake, but strange to say, it was not found on the New York shore though many places were visited.

Populus dilatata (*Lombardy Poplar*) is very abundant: it is a beautiful tree, exceeding in height the tallest trees near it. It is entirely free from the attack of Borers. The lower limbs are often 20 feet in length, giving the tree the form of a spruce. It is an introduced tree, as it is in Massachusetts, and is found growing along fence rows.

Populus grandidentata (*Large-toothed Aspen*) is very common, tall and straight. It is here considered one of the most valuable timber trees and for this reason it was difficult to obtain a good specimen. It is used for frames of buildings and is considered indispensable for floor timbers. Several stables and sheds were seen, the floors of which had been in use sixty to seventy years, and they were perfectly sound.

In one building there was a poplar timber very sound,

while the others, nine in number, one a pine, one an oak, the rest spruce, were so much decayed that the building was considered unsafe. A specimen of this poplar was finally procured 18 inches in diameter: the tree was 43 feet to the first limb, and 84 feet was the entire height.

POPULUS TREMULOIDES (*Common Aspen*) is everywhere abundant; its fine, bright green foliage making it very conspicuous. The bark of this tree is so white that it is hard to distinguish it from a birch at a distance of fifty feet. Its largest size is 18 inches in diameter and 40 feet high.

JUNIPERUS VIRGINIANA (*Red Cedar*) is quite a rare tree in this section and is restricted to the hills in the vicinity of Lake Champlain near Keeseville. The largest specimen was not over 6 inches in diameter and 15 feet in height.

THUJA OCCIDENTALIS (*Arbor Vitæ*, or, as it is called in New York, *Swamp Cedar*) has been very abundant, but it is now getting scarce as it seldom makes a second growth.

One reason for this is that, in the swamps where it flourishes, quantities of sphagnum and ferns grow most luxuriantly, and the dead wood, as soon as the old growth is removed, becomes as dry as tinder and is almost sure to be burned over. In any part of Clinton county one can find hundreds of acres, once a cedar swamp, now a mass of charred logs and unsightly blackened stumps. In Morrisonville there is a growth of these trees on the land of W. V. Hammond, several of which were cut and found to measure 12 feet in circumference. These trees are always the abode of large, black ants and often are partially decayed at the heart when they are over 2 feet in diameter. One of the old logs, with which the ground in this swamp is covered, was measured and found to be 77 feet long, and as the bark and sap wood had all decayed, leaving the upper

end over 4 inches in diameter, it is safe to conclude the tree must have originally been over 100 feet high: the broken end near the stump was 12 feet in circumference. The heart of this log was perfectly sound, which is rather remarkable, for all the other large logs were hollow.

ABIES BALSAMEA (*Balsam Fir*) is common and one of the handsomest trees in the forest. Its dark green foliage in exposed situations, softened down by the lighter green of the pines in the background, finally loses itself in the lighter blue green of the firs in the more shaded situations. This tree seldom grows to a large size, the largest that was found measured 22 inches in diameter and was 40 feet high. The specimen taken from the trunk of this tree was 5 feet long and 150 annual circles of growth were counted on the end of the log.

TSUGA CANADENSIS (*Hemlock*) is another of the large timber trees of this section as well as one of the most beautiful. It is often found near Morrisonville, 12 feet in circumference, and 60 feet high. The limbs begin near the ground, often as low as 5 feet on the old trees and project some 25 feet out from each side: this is not the case with trees 18 inches or 2 feet in diameter in the immediate vicinity as they are usually 15 or 20 feet to the limbs. The reason of this difference in form of growth is probably owing to the larger old trees growing in an exposed situation until these lower branches had attained this large size. One of these trees was cut which was 2 feet 6 inches in diameter and 257 circles of growth were counted. This tree is rare in the region of the Lake shore.

PICEA ALBA (*White Spruce*) is not a well known tree to farmers or wood cutters; but one man in Clinton county was found who knew it. He called it the "Cat Spruce" from its peculiar odor when the foliage was crushed, and

when a specimen was cut the name was found to be very appropriate. The largest tree found was 21 inches in diameter, and after it was cut it was found to be 85 feet long. It was covered on the upper limbs with full grown cones many of which were 3 inches long.

PICEA NIGRA (*Black Spruce*) is the most common of all the forest trees, growing abundantly from Essex Co., N. Y., to Montreal. In Ellenburgh it often attains a circumference of 12 feet and is from 90 to 100 feet high; but trees of this size are so far back in the forest that it is impossible to get a specimen in the autumn. The proper time to collect such specimens is in the winter, for in that section of the country, there is usually a solid crust on the snow which enables one to go where he likes, and with a horse one could select his own path and go over ground that it is impossible to pass over at any other season. A specimen of the Black Spruce was obtained which measured two feet in diameter and 190 circles of growth were counted.

LARIX AMERICANA (*Larch* or *Tamarack*) is one of the largest timber trees in Clinton county; several of the largest were measured. One in Altona was 13 feet in circumference and probably over 100 feet high. In Ellenburgh, there are hundreds of trees from 9 to 12 feet in circumference with a perfectly formed trunk slightly tapering and 30 feet to the first limb. There was one old log on the ground that was 110 feet long.

Before the large trees were found, a specimen had been secured in Morrisonville, 18 inches in diameter. It is a slow growing tree, the circles of growth being so near each other, it was difficult to count them. However 150 annual circles were found; the tree was 60 feet high.

PINUS RESINOSA (*Red Pine*) is abundant in all parts of Clinton and Franklin counties. In the town of Belmont, there is a growth of several acres and all the trees appear

to be of nearly the same size. They are tall and straight and with no limbs for fifty feet.

The trees stand so close to each other that the beautiful long dark green foliage shuts out the sky, and most of the sunlight, and makes this grove particularly interesting to the lover of nature. There was no undergrowth and the only thing on the carpet of yellow, formed by the annual deposit of dead leaves, was an occasional fallen tree. We cut one that measured 18 inches in diameter and was 94 feet high. There were 120 annual circles of growth on the stump. This was the largest tree found; but it was only 2 inches larger in circumference than many others and comparing observations made here and in eastern Massachusetts it was decided that these trees grow no larger at the north.

PINUS RIGIDA (*Pitch Pine*) grows abundantly on the light sandy soil in the vicinity of Lake Champlain, from Keeseville to "Point of Rush", a distance of forty miles and extending inland ten miles; and on the outskirts of villages, small groves of young trees of this species are found growing on sandy hill sides. No distinction is made here between the red and the pitch pines. A man was engaged to cut and haul a red pine 9 feet in circumference which he felt he could do. In three or four days he brought a pitch pine of the required size; it was not the species engaged, so it could not be taken. The following day he brought four men with him to ascertain why it was not red pine. They said one tree would sell as well as the other at the saw mill for red pine: all this was after both species had been shown, and the difference in bark, cones and leaves explained.

PINUS BANKSIANA (*Gray* or *Scrub Pine*) is quite a rare tree in New York. Seldom more than four or five growing within ten miles of each other. Solitary ones are most

common. As to size, they are seldom over 8 feet high though one was found in Altona 15 feet high and 8 inches in diameter, but this tree was partially decayed on one side of the trunk. In appearance, at a short distance, this tree resembles the black spruce more than it does a pine. The bark on the trunk is exactly like a spruce; the foliage is $1\frac{1}{2}$ inches long and from $\frac{1}{8}$ to $\frac{1}{6}$ of an inch wide; the cones grow in pairs and close to the limb; and they are different in shape from all other pines. This tree is known as the "unlucky tree" by the people in this part of the country. The more observant ones call it a cross between the pine and spruce.

I met several men of good general education, who were convinced of the danger arising from this tree, and who cited cases of its malignant influences (similar to the stories told of the Upas tree of Java). It is considered dangerous to pass within ten feet of its limbs and more so to women than to men. It is equally dangerous to cattle; so that whatever ill befalls a man, his family or his cattle, if there is one of these trees on his land it must be destroyed,—burned down by wood being piled around it, for no one would venture to cut it down.

Pinus strobus (*White Pine*) is the next tree in order. Trees of large size of this species are very scarce. There is one in Morrisonville 15 feet in circumference and 4 feet above the ground, tapering but little for fifty feet. A specimen could not be obtained from this tree for the owner had some special use for the entire log. Near Peru village there are three grand old trees; one 12 feet, and the other two 9 feet in circumference.

In Clinton county, twenty years ago, there were probably hundreds of these large pines, for we came across the massive stumps in many places on Lyon Mountain and

on the hills near Demmora; now there are not even young trees on this land.

The reason for this is that old pines were cut for some particular purpose, one or two in a place as they happened to grow, and as they were surrounded by other kinds of large trees, there was not sufficient ground opened to the influence of the sun to allow the seeds to germinate and grow. The entire township of Demmora of some ten square miles was owned by the state; ten years ago it was covered with a heavy growth of forest trees. The pines were cut first, then the valuable black cherry and such trees as "Bird's Eye Maple" until at last the entire growth was killed. Another cause of the destruction of forests is the careless use of fire in clearing land for the purposes of tillage; often in burning over a ten-acre lot one hundred acres or even more are destroyed by allowing the fire to get beyond control. A few such fires in any county in New York will destroy the remains of its natural forest. To remedy this evil is difficult, as usually the parties to blame cannot possibly pay damages, nor is it now a crime punishable by imprisonment.

There should be a law making it as great a crime to start a forest fire as to set a factory on fire or any other building. The railroads are able to pay damages, and after paying for a few fires they will become of rare occurrence. In Danvers, Mass., for three or four years, there were fires originating from railroads, but the companies were obliged to pay heavy damages; the result is, the road is kept free from weeds and in early spring, when there is plenty of surface water, a number of men are sent to burn over a strip of land on each side of the track, the whole length of the road or that portion of it where there is danger of fires.

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BULLETIN

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# A PAPER ON THE EARLY QUARANTINE ARRANGEMENTS OF SALEM.

BY ROBERT S. RANTOUL.

To JAMES L. CABELL, LL. D., OF VIRGINIA,
*President of the National Board of Health, and*
STEPHEN SMITH, M. D., OF NEW YORK,
*Chairman of Committee of the same, on the Quarantine Systems of the United States:*

GENTLEMEN:

You ask me for some account of the precautions taken by the people of Salem, from time to time, to protect themselves against the importation of foreign disease. You will naturally expect that such an account will make rather a long story, but I must preface it by saying that, from the date of the settlement to a recent period, there have rarely been any special precautions taken here against imported contagion, aside from the ordinary preventive measures made necessary by epidemics, so that the account which I have to give will naturally include not only what you ask for but a good deal more. Now and then, as you will see, the cargo of an

infected vessel was discharged under orders from our selectmen, on one or another of the islands at the mouth of our harbor; now and then an infected ship's company has been forbidden to go at large and been lodged in some isolated house or barn impressed for the service, or, later, in one or another of the pest-houses or inoculation hospitals provided by the town. But there has been, until lately, no established quarantine system,— nothing in the treatment of foreign disease, essentially differing from that of disorders of indigenous growth. Until 1799, we had no Board of Health, and no permanent Quarantine Ordinances of our own, but only temporary regulations.

Nor was this state of things due at all to exemption from exposure. On the contrary, we have been a commercial people from the start, and wherever there is water-traffic there is exposure. Indeed, the very epidemic which depopulated this coast in 1612–17, and which, by weakening the native tribes, may be said to have rendered possible the precarious maintenance of the settlement of 1624–6,—for before its ravages the Pentucket tribes could muster three thousand braves, and afterwards some Sagamores had not a dozen men, — this deadly epidemic is thought to have been the small-pox, and to have been contracted by the natives from intercourse with the French fishermen who then frequented the Bay. And the first large European reinforcement which reached us, in 1629, came stricken on the voyage with this same distemper, which proved fatal at sea to the child of their chronicler, the Elder Higginson, among others, and which, introduced by their arrival into the infant colony of some two hundred souls, reduced its numbers about one-half in a single winter.

Salem was, from the first, a seafaring town. Possessed of one of the few good harbors between Portland

and New York,—settled in 1626 by a party of fishermen who deserted Cape Ann, and found this an eligible seat because the promontory on which we live has navigable water and anchorage on either side,—the colonists lost no time in establishing their familiar industry and making themselves masters of the riches of the sea. Europe was Catholic, and no less than one hundred and fifty-three fast days had been set apart in the year, on which it was lawful to eat fish only. As late as 1563 it was penal for an Englishman to eat flesh on Wednesdays and Saturdays without a government license. A century later, in a code for Massachusetts printed in London in 1655, and preserved by Hutchinson, it is provided "Because fish is the chief Staple commodity of the Country" that "fishermen, mariners and shipwrights shall be allowed, man for man, some or other of the labourers of the country to plant and reape for them" for seven years, such laborers to be appointed and paid by the treasurer of the Commonwealth. Another century finds the two-penny revenue stamp of 1755 inscribed with a codfish and the legend "Staple of the Massachusetts," and as if in anticipation of all this, King James, when asking "what profit should arise" from these settlements which should justify the royal favor, was answered in the single word "Fishing." To which the King replied: "So God have my soul, 'tis an honest trade,—'twas the apostles' own calling."

Thus, in the beginning, the colonists looked to fishing, first, for the food on their tables, and, following the practice of the natives, for a dressing for their gardens and fields, and, next, for a valuable article of export trade which brought them rich return cargoes from other colonies, from the West Indies, and from the ports of Europe.

Perhaps I can suggest in a few words the early magnitude and variety of our maritime interests, and thus jus-

tify, in a degree, the extent to which I must draw on your space and patience in this account.

No settlement was attempted at this point until 1626. A dozen families came here then from an abandoned fishing station at Cape Ann, four or five leagues away, where they had been established, with others, by the Dorchester Company in 1624. They were mostly fishermen from the west coast of England, and, being dissatisfied with their Cape Ann location, had abandoned it, some for England, some for Virginia, and a little remnant for this "pleasant and fruitful neck of land" now called Salem. Conant, Woodbury, Balch, Palfray and others, evincing a determination to maintain themselves here, they were reinforced, first, by a party under Endicott in 1628, then by another which came with Higginson in 1629, and finally by the great Suffolk Emigration of 1630, under Winthrop. How promptly after their establishment here they began to develop commercial relations will readily appear.

In the summer of 1629 seven or more shipwrights were at work here. Shallops for the fishing business were already on the stocks. A barque had already been built and was to go to the Banks and bring back the fishermen from English fishing vessels, which returned to England direct from the Banks with their fares of fish. A storehouse was ordered, April 17, for the shipwrights; another, May 28, for the fishermen; nine fishermen are sent over at the company's charges to remain and initiate others in the craft; fish is ordered for a return cargo; lots are assigned in the common lands to fishermen in severalty to build flakes or stages, for curing their fares.

In the year 1636–7, a town order prohibited the exportation of lumber, which "hath not onely bared our woods verie much of the best tymber trees, of all sorts, but bereaved also our inhabitants of such boards & clap-

boards whereof they stand in need;" two spots "by y^e^ waters side" are assigned to master-builders for ship building; the Ship "Desire"[1] of 120 tons, built here in 1636, had made a voyage to New Providence & Tortuga; before a twelvemonth ended a Fast was observed "on account of prevailing fevers, small-pox & low state of religion;" the first importation of indigo and sugar seems to have been made in 1639, though cotton had arrived earlier; on "the 22^th^ of the 3^th^ m^o^ called May" of that year the General Court voted "for further incuragement of men to set vpon fishinge, * * that such ships & vessels & other stock, as shall bee properly imployed & adventured in takeing, makeing & transporting of fish, according to the course of fishing voyages & the fish itselfe, shall bee exempt for 7 years from hencefourth from all countrey charges," * * Fishermen & Ship-carpenters were exempt from "training" and so important to the colony had the export of dried fish become that "it is forbidden to all men, after the 20^th^ of the next month, to imploy any codd or basse fish for manuring of ground," upon pain of losing "the privledg of exemption from publike charges;" "timber trees fitt for shippinge" are protected by vote of a general town meeting in 1640, and "none shall cleave such trees upp to clapbo[ards] or pipestaves;" in 1641, ship-building is to proceed under the eye of a sworn surveyor because "the countrey is nowe in hand w^th^ the building of Ships, w^ch^ is a business of great importance for the comon good" and at the urgency of Rev. Hugh Peters of the First Church, a 300 ton ship is built here; the next year, 1642, "tymber within the towne lymitts" is still further protected, by vote of town meeting, and, in

[1] Four years later, she made the passage from Salem to Gravesend in twenty-three days, — famous sailing for those times.

October, a vessel of 200 tons, built here during the summer and laden with pipe-staves and other merchandise, sailed for Fayal; in 1643, Salem was trading with the mother country, Bermuda, Virginia, Barbadoes, Tortuga, and the Leeward Islands; in 1645, a commercial agent for the town at Barbadoes had been proposed in the town meeting, and in March, 1647–8, appear the first Quarantine Regulations.

Of these, Gov. Winthrop in his journal says: "It pleased the Lord to open to us a trade with Barbados and other Islands in the West Indies, which as it proved gainful, so the commodities we had in exchange there for our cattle and provisions, as sugar, cotton, tobacco and indigo, were a good help to discharge our engagements in England. And this summer there was so great a drouth, as their potatoes and corn, etc., were burnt up; and divers London ships which rode there were so short of provisions as if our vessels had not supplied them, they could not have returned home; which was an observable providence, that whereas many of the London seamen were wont to despise New England, as a poor, barren country, should now be relieved by our plenty.

"After the great dearth of victuals in these islands followed presently a great mortality (whether it were the plague, or pestilent fever, it killed in three days) that in Barbadoes there died six thousand, and in Christopher's, of English and French near as many, and in other islands proportionable. The report of this coming to us by a vessel which came from Fayal, the court published an order that all vessels which should come from the West Indies, should stay at the castle, and not come on shore nor put any goods on shore, without license of three of the council, on pain of one hundred pounds. Nor any to go aboard &c except they continued there &c

on like penalty. The like order was sent to Salem & other haven towns."

It should be understood that the "Castle" was in the Harbor of Boston some leagues distant from Salem, and the order requiring inward bound vessels to stay there may have had no bearing on vessels bound to Salem, which would not necessarily come within hail of the Castle. Besides these precautionary measures a Fast was ordered by the Court, "being sencible of the great mortality of o$^{r}$ country men in the West Indies" and for other causes.

The first colonial legislation, which I find, intended to regulate Ports of Entry, bears date 1668, and in all the twenty-seven sections of the act, there is no allusion to the public health, so far was this matter left in the hands of the local authorities. Indeed, in Salem, we only completed our harbor fortification by impressing men in 1669, so that it would not have been easy before that date to enforce an act like that of 1647. This act I insert entire. It was repealed about two years later, and with the exception of a similar act suggested by the London plague of 1665, and also of two years' duration, and limited to ships from England as that had been to ships from the West Indies, no colonial legislation touching our subject was attempted until the end of the century, when a general quarantine law of larger scope, passed in 1699, was disallowed the next year by the Privy Council, on the ground that it usurped powers of regulating trade properly belonging to the Royal Governor and Council. And it may have been due to this jealousy that the towns preferred to make their own quarantine arrangements rather than invite the exercise of the veto-power by legislative enactments. The act of 1647–8 is as follows:

"For asmuch as this Co$^{r}$te is credibly informed y$^{t}$ y$^{e}$ plague, or like greivos [in] fectious disease, hath lately ex-

ceed$^{gly}$ raged in y$^{e}$ Barbadoes, Christophers, & oth$^{r}$ i[sl]-ands in y$^{e}$ West Indies, to y$^{e}$ great depopulat$^{g}$ of those, it is therefore ord$^{r}$ed, y$^{t}$ all [our own] or oth$^{r}$ vessels come$^{g}$ from any ꝑts of y$^{e}$ West Indies to Boston harbor shall stop [and come to an] anchor before they come at y$^{e}$ Castle, und$^{r}$ y$^{e}$ poenalty of 100£, & that no ꝑson comeing in any vessell from the West Indies shall go a shore in any towne, village, or farme, or come within foure rods of any oth$^{r}$ ꝑson, but such as belongs to the vessels company y$^{t}$ hee or shee came in, or any wayes land or convey any goods brought in any such vessels to any towne, villag$^{e}$, or farme aforesaid, or any oth$^{r}$ place w$^{th}$in this iurisdiction, except it be upon some iland where no inhabitant resides, w$^{th}$out licence from y$^{e}$ councell, or some three of them, und$^{r}$ y$^{e}$ aforesaid poenalty of a hundred pound for ev$^{ry}$ offence.

"That no inhabitant, seaman, or other ꝑson whatsoev$^{r}$, reciding w$^{th}$in this iurisdiction, shall go aboard any such shipp or vessell comeing from the West Indies aforesaid, or buy or otherwise take into his possession any goods or marchandize brought in any such vessell, w$^{th}$out licence as aforesaid, und$^{r}$ y$^{e}$ poenalty of 100£, & to be otherwise confined or restrained, as the said councell, or some three of them, shall appoint; & to y$^{e}$ end y$^{t}$ all ꝑsons may have due information hereof, it is hereby agreed, y$^{t}$ this ord$^{r}$ shalbe forthw$^{th}$ published, & a coppy thereof sent to y$^{e}$ captaine of y$^{e}$ Castle, togeth$^{r}$ w$^{th}$ com̄ission to him to cause ev$^{r}$y shipp or other vessell, belonging to y$^{e}$ country or any oth$^{r}$ place, y$^{t}$ shall come from any ꝑt of the West Indies aforesaid, to stop & come to an anchor before they shall passe y$^{e}$ Castle, & then send unto them a coppy of this order, & there cause them to remaine till furth$^{r}$ order from y$^{e}$ councell, or some three of them, whose counsell is to be taken therein; this ord$^{r}$ to continue till this Co$^{r}$te or

the councell of y^e^ comonwealth shall see cause to repeale y^e^ same.

"It is furth^r^ ord^r^ed, y^t^ a coppy of this order shall be forthw^th^ sent to the sev^r^all cunstables of ev^ry^ port towne in this iurisdiction, w^th^ warrant to give notice thereof, w^th^ all possible speed, to any vessell comeing from y^e^ West Indies aforesaid, upon y^e^ first view thereof, & furth^r^ to see to y^e^ execution of this ord^r^, according to y^e^ utmost of their ability, & y^t^ y^e^ councell, or some three of them, shall have pow^r^ to appoint some convenient place, upon some of y^e^ ilands or oth^r^ fit places, where such psons & goods shal be sheltered for a time, & to do any thing of like nature y^t^ shall be necessary for their preservation, & welfare of y^e^ country."

The order was repealed, 2 May, 1649.

"The Courte doth thinke meete that the order concerning the stoping of West India ships at the Castle should hereby be repealed, seing it hath pleased God to stay the sicknes there."

The first action of the selectmen of Salem now on record, touching our subject, bears date 1678, and is in these words:

"Att a metting of the selectmen 2 Sep^t^. 1678.

The prouidence of god so ordering that the distemper of the small pox still continuing at Boston, severall of the Selectmen being ferfull of that distemper & others of them being ancient & not able to travell the Selectmen aforesaid have requested the worship^l^. Major W^m^. Hathorne to deliver in to the Honored Court of assistance our answer to the resons of apeale of Nath^l^ & John Puttman and the rest concerned with y^m^ & to speake to that case as nede shall require in the behalfe of the towne of Salem."

Meeting of Selectmen 17 : 8 : 1678.

"It is ordered that Wm. Stacy who is sick of the small pox doth not presume to come abroad till three wekes after this date be expired & that he be very carfull y$^{t}$ when y$^{t}$ time be exspired he shift his clothes & doe not frequent any company till he be wholy cler. of that infection."

Meeting of Selectmen 25 : 10 : 1678.

"The selectmen being informed y$^{t}$ Will$^{m}$ Lord Jun$^{r}$ is visited w$^{th}$ the small pox at his father's house, the selectmen doe order y$^{t}$ Wm. Lord Sen$^{r}$ his wife & children y$^{t}$ live wt$^{h}$ him doe kepe within ther house, & y$^{t}$ they doe not ofer to sayle any of ther ware, viz: bread, cakes, ginger bread & the like & that they sufer non to come to ther house but what nessesity requires upon the penalty of twenty shillings in money for each offence.

"And it is ordered y$^{t}$ Tho. Stacy doth forbare grinding at the mill & y$^{t}$ he be carfull he doth not infect others, on the penalty of twenty shillings."

In 1680 the Selectmen of Salem seem to have found it necessary to establish a quarantine of their own by the following action, which, though temporary in its nature, will be seen to cover a period of twenty years, in which no help was had from general legislation.

"At a meeting of the Commission$^{es}$ & Selectmen of the towne, June, 1680.

"In consideration y$^{t}$ it hath pleased God to visit the inhabitants of Barbados with the small pox which is an infexious distemper and severall vessells are expected from thence: And it being our duty y$^{t}$ all due care may be taken to prevent itts being brought in amonghts us:

"Wee doe therefore order, that not any vessell which comes from the Isl. of Barbados, shall have libertye to land any cotten wooll or other goods from on Board theire vessel,

nor any one of theire Comē or passenger that shall come with them from thence shall have libertye or bee suffered to come on shore, before thay are vissetted or examined by James Poland or John Clifford one or Both of which wee doe heareby fulley impowre to goe on Board all such vessell or vessells and for that end to impress any boate or canoe & persons sutable to attend them therein, likewise to give notice to them y$^{t}$ thay suffer not any person or persons to come on Board, that neither the Companye or passengers come on shore nor any person or persons what soever goe on Board of them upon the uttermost perrill, untill a tru acc$^{o}$ bee given to the Selectmen of theire health & condition thay are in by the sayd persons impowred, that soe an order from the Selectmen may bee given forth either to licence them to come on shoare, or further to prohibit & forbid according as the case may justly require."

"At a meeting of William Browne & Bartholomew Gedney Esq$^{r}$ togather with the Selectmen who ordered a warrant to bee drawne as followeth, June 14th, 1680.

"To Constable Peter Chevers you are in his maj$^{e}$ name heareby required to impress William Marston to cary over the man hee hath brought into the towne, (which man is visseted with the distemper of the small pox) in the same boate hee brought him unto the house of Abraham Read, on Royall Syde, which sayd house if the man bee not willing to reseave him into it & withdraw himselfe into some other place for a short tyme: you are then heareby to impress the house & enter into it & leave the distempered man there, & William Marston with him to tend him; & to provide for them all such things as are nessesary upon the townes acc$^{o}$ & to cause Abraham Read to depart, or if hee bee not at home then to open the house as aforesayd, likewise to order William Marston to sink the boat in some

convenient place for her clensing & all & every part heareof you are to attend untill you shall reseave further order & heareof you are not to fayle."

At a meeting of the Selectmen January 21th, 1680–1.

"Abraham Reads Rates are abated to Constable Jn° Batchelder upon consideration of his house being improved to put a sick man in, viz: the man y^e^ was viseted with the small pox."

"Att a metting of the Selectmen 19 : 8 : 1683.

"There being certaine information given to the Selectmen, (& by M^r^. John Tawleys owne acknowligement) y^t^ M^r^. Jn° Tawley who latley arived from Newfound land has brought in the distemper of the small pox haveing one man on board sick of the same & considering the great danger of the spreading of such a distemper amongst us he haveing brought home many passengers whome he has landed & they are scatered a broad ——

"This following warrant was given to ye Constables.

"You & every of you are herby required in his majesties [name,] forthwith to send ffrances Eliot on board M^r^ Jn° Tawleys Katch & ther to tend ye sick man & forth with to send & cary downe to the house y^t^ Sarj^a^ Jn° Clifford lived in all the passengers & seamen y^t^ came in M^r^ Jn° Tawleys from Newfound land & can be found in this towne & there to confine them till further order be taken and y^t^ Mr. Jn° Tawley be confined to his house & y^t^ his boy be either sent on board ye Katch or downe to the aforesaid house."

"At a meeting of the Select men 8^th^ 7. 85.

"The Select men being informed that the small pox doth greatly rage upon the Island of Burbados, doe therefore order that all cotten wool that is now or hereafter shall be imported from said Island into this harbor of Salem shall be landed at Bakers Island & there to remaine untel the

Select men shall give order for the removall of the same."

[Baker's Island is four or five miles from Salem.]

"Att a meeting of the Selectmen y^e^ 16th of Aprell 1686.

"Itt is Ordrd that by reson of the prevailing of the small pox in the Iland of Barbados y^t^ all cotten wooll now imported into this harbor or shall bee here after dureing the tyme of that siknes there shall bee landed att Winter Iland in the warehous y^t^ was Cap^t^ Jn^o^ Corwins & not to take it thence till order from the Selectmen."

[Winter Island is just at the mouth of the Harbor, and was the site of the Fort.]

At a meeting of the Select men 18^th^ May 1691.

"Ordered that noe ꝑson whatsoever within the bounds of this towne that hath lately had the small pox, presume to come abroad into company or goe to meeting without ꝑticular liberty & lycence first had & obtained from the Selectmen for the tyme being on penalty of twenty shillings for every such offence & that no ꝑson whatsoever shall air or hang abroad any lining, beding or cloathing out of any house where the distemper is or hath been lately, near any dwelling house or nigh the Mayn street on the penalty aforesaid."

"At a towne meeting held June 16, 1701.

"Voted that a pest house be builded, not exceeding 50^lb^ in money & s^d^ 50^lb^ be raised and pay^d^ in to y^e^ T. Treas^r^ at or before y^e^ last day of Decemb^r^ next come twelve month, & y^t^ y^e^ Selectmen consider of a convenient place, & make report thereof to y^e^ next town meeting & also y^t^ y^e^ Selectmen are impowred & desired to agree w^th^ some sutable persons for to performe y^e^ same & to indevour to procure some person to advance money on y^e^ credit of this town vote for y^e^ performance thereof, as soon as may be."

"At a meeting of y^e^ Selectmen Octob^r^ 16th, 1702.

"Ord^d^ y^t^ if any dy of y^e^ small pox they shall be buried about 3 of y^e^ clock in y^e^ afternoon.

"Ord^d^ y^t^ Constable Jn^o^ Williams doth attend y^e^ funeralls of any y^t^ dy of y^e^ small pox & walk before y^e^ corps to give notice to any y^t^ may be in danger of y^e^ infection."

Before the action last recorded a Provincial Act, dated June 25, 1701, had gone into effect (we will examine this act presently); it differed in scope and character from the temporary orders formerly issued by the General Court, and was kept alive, with few additions and modifications, for a century. But it is a surprising fact that, from the settlement of this colony to the year 1701, the matter of providing by law against the importation of contagious distempers should have received so little attention among a people devoted to navigation, frequently scourged with unmanageable epidemics and prone to legislate on all sorts of subjects whether profane or sacred. With the exception of these three enactments, neither of which remained in force more than two years,—two of which were carefully limited in their territorial scope,—the local authorities got no aid from the General Court before 1700, in protecting their populations against foreign disease, and even the local authorities themselves were very sparing of their efforts in this behalf. Possibly some explanation of this omission may be found in the obvious fact that the leading men of these seaboard towns, upon whom would devolve the making and enforcing of local regulations, were at the same time the ship-owners and ship-masters who could, by a tacit understanding among themselves, observe such regulations and thus render needless all appeal to legal authority. The men who controlled the commerce of the infant colony were beyond all others

the men who had its home interests at heart and they may have established, by mutual consent, a system for the protection of the town, without spreading it on the records or having recourse to penalties. It is proper to say that frequent days of public fasting, humiliation and prayer were resorted to by the law-making powers, colonial and provincial, as among the preventive measures of the day. The very frequent recurrence of these observances, which were intended to "avert the frowns of Providence" as discovered in "Fevers," "Small-pox," "Plagues" and "Unwonted disease," as well as in "the low state of religion," "sins," "blastings," "grasshoppers," and the "palmer-worm," would, if the long list of dates were enumerated, show what a terrible scourge these diseases were, especially the small-pox before the introduction of inoculation.[2]

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[2] Inoculation was introduced into America in 1720 by Dr. Zabdiel Boylston of Boston who for some years, alone and under great discouragements of hostile legislation as well as personal peril, persisted in the practice. It seems to have prevailed earlier and more generally here than in Europe. See "Diseases of America," a letter dated "New York, December, 1780," from the pen of Dr. Johann David Schoepff, Surgeon of the Anspach-Bayreuth Troops in America. Also, for the connection of Dr. Increase Mather with the subject, see Collections Mass. Historical Society, 1st Series, Vol. IX, pp. 275–80. Dr. Benjamin Waterhouse of Cambridge, who, with Dr. James Jackson of Boston in 1796, introduced vaccination into America, wrote as follows in 1787 to his friend Dr. Holyoke of Salem.

Cambridge Octob$^{r}$ 23$^{d}$ 1787.

Sir

I herewith send you a Book entitled "an Inquiry how to prevent the Small-Pox," written by Dr. Haygarth of the City of Chester in England. This learned and benevolent Physician intends to publish *a Proposal for exterminating the S. Pox from Great Britain*, and as he thinks the communications I made him (as expressed in p. 138) of no small consequence to his plan, and requests more information, I feel heartily disposed to give all the assistance in my power, which is indeed no more than collecting the best information our Country affords.—With this view I send the publication for your perusal.—

I suspect that we in N. England know more of the S. Pox than they do in G. Britain, and that there are more and better materials for forming an accurate history of that Disease, with us, than with them?—Even their Physicians seem to have forgotten, that an Inhabitant of Boston was the first who put in practice the obscure hints given by Timonius of Constantinople, and transferring it to England, thence diffused this salutary practice among every polished nation in the world.—There appears an heroism in D$^{r}$ Boylston that is worth recording.—. . . . .

I remain,
very respected Sir,
your humble servant
B. Waterhouse.

Dr. Ed. Aug. Holyoke M. D.
Salem, Mass.

About the year 1700, a general system of regulation began to develop itself, resulting in a law differing only from the vetoed act of 1699, in that it enjoined every justice of the peace to intervene in executing it, and the selectmen to take care of the sick at the cost of the persons or of towns, save in the case of paupers without settlement, they to be provided for at the cost of the Province. This act of the last year of William III was the basis of our quarantine system. It was passed during a period of disquiet. The charters were in danger. Massachusetts was asserting rights and exercising powers denied to her by the advisers of the Crown; and in the midst of the confusion incident to the retirement of Earl Bellomont from the Executive Chair of the Province and the resumption of that coveted seat by the once expatriated Dudley, and while it was temporarily filled a second time, for a few months, by the aged and decrepit Stoughton, then Lieutenant Governor, this fortunate law seems to have slipped through the prescribed forms of enactment. These are its terms.

AN ACT PROVIDING IN CASE OF SICKNESS.

Be it enacted by the Lieutenant-Governour, Council and Representatives in General Court assembled, and by the authority of the same,

[Sect. 1.] That, for the better preventing the spreading of infeetion, when it shall happen any person or persons coming from abroad or belonging to any town or place within this province to be visited, or that late before have been visited with the plague, small pox, pestilential or malignant feaver, or other contagious sickness, the infection whereof may probably be communicated to others, the selectmen of such town be and hereby are impowred to take care and make effectual provision, in the best manner they can, for the preservation of the inhabitants, by removing and place-

ing such sick or infected person or persons to and in a separate house or houses, and by providing of nurses, tendance and other assistance and necessaries for them, at the charge of the partys themselves, their parents or masters (if able), or otherwise at the charge of the town or place whereto they belong.

[Sect. 2.] And in case it happen any person or persons to be visited with sickness in any other town or place than that whereto they belong, and thereby occasion a charge to such town, the selectmen shall lay the accompt thereof before the justices in court of general sessions of the peace, within the county where the town lyes whereto such person or persons belong; and the justices, having adjusted the accompt of such charge, and allowed so much thereof as they judge reasonable, shall order payment thereof to be made by the treasurer of such town, when the persons themselves, their parents or masters, are unable to pay the same. And when it shall happen such indigent persons, not to be inhabitants, or belonging to any town or place within this province, and the proper charge thereof in case they need reliefe, then the charge of their sickness shall be defreyed out of the publick treasury of the province, by warrant from the governour, with the advice and consent of the council.

And be it further enacted by the authority aforesaid,

[Sect. 3.] That, if need so require, any two justices of the peace may make out a warrant, directed to the sheriffe of the county or his deputy, or constables of the town or place where any such sick person or persons shall be, requiring them, or any of them, in his majesty's name, with the advice and direction of the selectmen of the same, to impress and take up convenient housing, lodging, nurses, tendance and other necessaries, for the accommodation, safety and relief of the sick.

And be it further enacted by the authority aforesaid,

[Sect. 4.] That if any person or persons, seamen or passengers, belonging to or transported in any ship or vessel arriving to any port or harbour within this province, happen to be visited with the plague, small pox, pestilential or malignant fever, during the voyage, or to come from any place where such sickness prevails and is common, any justice or justices of the peace within the county, to whom the notice or information thereof shall be given, shall forthwith take care to prevent and restrain all persons belonging to or transported in such ship or other vessel from coming on shore, and if any be before on shore to send them on board again, as also to restrain persons from going on board such ship or vessel; and to that end may make out a warrant, directed to the sheriffe of the county or his deputy, or constables of the same town, who are accordingly impowred and required to execute the same. And such justice or justices are forthwith to transmit the intelligence thereof to the governour or commander-in-chief for the time being, who is hereby impowred, with the advice and consent of the council, to take such further order therein as they shall think fit for preventing the spreading of the infection.

[*Passed June 25; published June 28, 1701.*]

From this time on, the tendency of provincial legislation was to throw more and more of the burthen of caring for the health of the growing populations upon local authorities by enlarging their powers. I shall not encumber this account with a recital of the modifications suggested by a century of progress before the final supersedure of this fundamental act, June 22, 1797. The action of the selectmen of Salem, which I shall detail, found its warrant in this fundamental law of 1701 and its several amendments.

In April, 1705, the Sloop Sterling brings the Small-Pox from Barbadoes and her crew are put ashore on Misery Island [an island about five miles down the harbor].

In the summer of 1711, the small pox was again brought in from Barbadoes in a brig commanded by Capt. Eben. Hathorne.

In 1716–17 the Province built a Hospital on Spectacle Island in Boston Harbor and all infected persons and merchandise which could "without great inconveniency and damage" be sent there, were so ordered. This was the first quarantine establishment in Massachusetts.

April 22, 1721, it was agreed with Malachie Foot and Matthew Barton to keep watch and ward at Winter Island until all vessels due "from Barbadoes and Tortudas are arrived, to prevent the infection of the Small Pox." [We then cleared eighty sail per year for foreign ports.] "An house was appointed for those who should take the disease." It was raging also in Boston and "threatened the land," having been brought to that port by the "Saltortugas fleet." Dr. Boylston and Rev. Cotton Mather urged inoculation.

In 1721–2 a new Provincial act was passed for protection against the plague then raging in France and the Mediterranean ports, which required vessels from those parts to perform quarantine for forty days at least at some appointed place, on penalty of death to every master or commander who should after notice "presume to unlade any part of his goods or cargo before he have perform'd such quarentine." The operation of this act was limited to three years and it was not extended. It covered also vessels from Newfoundland, Cape Breton and Canso, which had within six months been in any port of France or other infected place, or taken on board goods from such ports. A resolve of the same year, 1722, declared that the orig-

inal act of 1701, authorized the removal of infected persons into separate houses, by warrant of the justices with the consent of the selectmen.

"At a meeting of the Selectmen, present, Cap$^{t}$ Bowditch, M$^{r}$ Flint, M$^{r}$ Orne, Tho. Barton. May 11, 1726.

Ordered, Whereas M$^{r}$ John Crowningshield in a sloop of this place, arrived on Saturday night last from the West Indies and it haveing happened in their passage to have one of his men visited with the small pox & but very lately recovered thereof, and for the better preventing the spreading of the infection; on Sabbath day morning early a warrant was obtained from two of His Maj$^{ties}$ Justices as the law directs, & executed, to prevent and restrain all persons belonging to the vessell from comeing on shoar as also to restrain all persons from going on board till farther order, and for the more effectuall accomplishing of the affair the Selectmen did order & desire M$^{r}$ Rich$^{d}$ Palmer & Malachie ffoot to ward on the Neck, near to the place where the vessell layd all that & every day till other care & more effectuall provision could be made. Wherefore the Selectmen do now agree & have taken up Cap$^{t}$ Gardners little house on the point below Benj$^{a}$ Holms's in the South field, to remove & place the infected persons in, and the house being out of repair it is Ordered that it be forthwith repaired & made convenient for the service."

"At a meeting of the Selectmen present, Cap$^{t}$ Bowditch, M$^{r}$ Manning, M$^{r}$ Flint, M$^{r}$ Orne, Tho$^{s}$ Barton. May 27, 1726.

Ordered, The Selectmen takeing into consideration the case of Thomas Marston, the person lately recovered of the small pox on board M$^{r}$ Crowningshield in his passage from the West Indies, he haveing been on shoar about a fortnight, & with Abraham Cabot his nurse, confined to Cap$^{t}$ Gardners house in the South field, and all proper

means used for their cleansing whether or no they may now be allowed with safety to come home to their families; It is agreed that they may not come away yet but that they keep there one week longer, or 'till after the Selectmens next meeting on the first Monday of the next month."

"At a meeting of the Selectmen present, Cap$^{t}$ Bowditch, M$^{r}$ Manning, M$^{r}$ Orne, Thos. Barton. June 16, 1727.

Ordered, Whereas M$^{r}$ William Cash master of a Brig$^{t}$ of this place, is this day arrived from New Castle, and it haveing happened in his passage to have two of his men visited with the small pox, and as yet are not perfectly recovered & free from the infection. Wherefore for preventing the spreading of the infection, it is agreed that a warrant be procured from His *His* Maj$^{ties}$ Justices as the law directs, to prevent & restrain all persons, seamen, passengers & others from coming on shoar & going on board without leave of the Selectmen or furthur order from the Justices. A warrant is accordingly obtained & by Constable John Chapman executed.

June 18. The Brig$^{t}$ being now ordered up toward fforest River behind the South field the two men that never yet had the small pox are taken on shoar to Capt. Gardners house on the point behind Holms's in the South field, to prevent their taking any furthur infection, there to remain 'till after the next full or change of the moon, that if possibly they may escape having the distemper, and the meantime the other men with the master are confined on board, & not allowed to come on shoar 'till both they and the vessell shall be sufficiently cleansed and air'd."

"At a meeting of the Selectmen present, Cap$^{t}$ Bowditch, M$^{r}$ fflint, M$^{r}$ Manning, M$^{r}$ Orne, M$^{r}$ Procter, Cap$^{t}$ fflint, Thos$^{s}$ Barton. July 3, 1727.

Ordered, The selectmen taking into consideration the case of the two men taken ashoar from M$^{r}$ Cash to prevent

the spreading of the infection of the small pox and they having been well cleansed & air'd, it is advis'd that they may with safety go to their homes, and that Sam[l] Calton & Jon[a] Hart who had the small pox in their passage do come ashoar at the same house in the South field in order to their being further cleans'd & air'd."

"At a meeting of the Selectmen present, M[r] Orne, Cap[t] Plaisted, Cap[t] Barnard, M[r] Ward, Tho[s] Barton. Octob[r] 16th, 1730.

Ordered, Whereas information is given that there are some careless persons that going to & from Marblehead in this time of their visitation of the small pox and that some has been to visit the sick there which put us much to fear the danger of infection thereby—Wherefore the Selectmen do take this oportunitie of a town meeting for choosing of jurymen to give out a warrant, to advise with the Town what may be proper to be done for their preservation and that there be instructions given the Selectmen accordingly.

"Ordered, Whereas the Selectmen are informed that Do[r] Geo. Jackson of this town is gone to Marblehead in order to visit the sick of the small pox there, and we doubt unknown or without the leave of the Selectmen of that Town, Wherefore it is agreed that the town clerke write to the Selectmen of Marblehead and acquaint them thereof, as also to write to Do[r] Geo. Jackson concerning the same, and that we look upon ourselves to be in great danger thereby, and shall take all proper methods to prevent his passing & repassing thither."

"At a town meeting legally assembled Dec. 21, 1730. Voted.— Cap[t] Ichabod Plaisted Moderator.

It being accounted unsafe to the inhabitants of this town that the South Ferry in Salem at this time be kept up, to carry & recarry passengers & goods to & from the town of Marblehead, where the infection of the small pox is so prevailing —Wherefore

Voted, That the said Ferry be stopt from y^e^ 23^d^ day of December instant untill such time as the Selectmen may judge it safe & necessarie to open the same.

Voted, That no inhabitant of the Town of Marblehead from & after the 25th instant be admitted to reside in this Town within the Town Bridge, as an inmate, boarder, or tenant, untill such time as the Selectmen may judge they can be allowed with safety, nor in the out parts of the town without leave of the Selectmen.

Voted, That there be a committee of five persons chosen to be assisting to the Selectmen in case the small pox should come into this town.

Voted, To serve on this committee, M^r^ James Lindall, Cap^t^ Joseph Hathorne, Cap^t^ Tim^o^ Orne, M^r^ Sam^ll^ Barton, & M^r^ Warwick Palfrey."

In this vote of Decr. 21, 1730, we have the germ from which was developed our modern Board of Health. The five citizens selected for this auxiliary function were of our best. In the year 1730 the small-pox was making itself a troublesome factor in public affairs. A Provincial Act was passed empowering the several Courts of Justice to abandon the shire-towns when threatened, and hold lawful terms in towns not affected, and the General Court itself was driven out of Boston by the pest, sitting in the "College Hall" at Cambridge & in the East Meeting House at Roxbury.

The next year produced the following Provincial legislation:

An Act to prevent persons concealing the small-pox.

Whereas it has been represented that the small-pox has been designedly concealed in divers families within this province, which practice greatly tends to the spreading of that mortal distemper; for remedy whereof,—

*Be it enacted by His Excellency the Governour, Coun-*

*cil and Represent[ati]ves in General Court assembled, and by the authority of the same,*

[Sect. 1.] That from and after the publication of this act, when any person is visited with the small-pox, in any town of this province, immediately upon knowledge thereof, the head of that family in which such person is sick, shall acquaint the selectmen of the town therewith, and also hang out, on a pole at least six feet in length, a red cloth not under one yard long and half a yard wide, from the most publick part of the infected house, the said sign thus to continue till the house, in the judgement of the selectmen, is throughly aired and cleansed; upon penalty of forfeiting and paying the sum of fifty pounds for each offence, one-half for the informer and the other half for the use of the poor of the town where such offence shall be committed, to be sued for and recovered by the treasurer of the town, or the informer, by action, bill, plaint or information, in any of his majesty's courts of record; and if the party be unable or refuses to pay such fine, then to be punished by whipping not exceeding thirty stripes.

And be it further enacted by the authority aforesaid,

[Sect. 2.] That when the small-pox is in any town of this province, and any person in said town, not having had the same, shall then be taken sick, and any pustulous eruptions appear, the head of that family wherein such person is, shall immediately acquaint one or more of the selectmen of the town therewith, that so the sd selectmen may give directions therein; upon penalty of forfeiting the sum of fifty pounds, to be recovered and applied for the uses aforesaid, the whole charge to be born by the person thus visited, if able to defrey the same, but if in the judgement of the selectmen of the town such person is indigent and unable, then the said charge to be

born by the town whereto he or she belongs: *provided, always*, that this act shall not be understood to extend to persons in any town where more than twenty families are known to be visited with the small-pox at one and the same time.

[Sec. 3.] This act to continue for the space of ten years from the publication thereof, and no longer. [*Passed February 2; published February 3, 1731–2.*]

In 1737, the Province Hospital was removed from Spectacle to Rainsford Island, in Boston Harbor.

In 1739, a Provincial act which seems to have been anticipated by the order of our selectmen touching the Marblehead Ferry, and which was extended from time to time for twenty years, provided for the regulation of Ferry-ways and for the prompt reporting of strangers arriving from neighboring colonies. It was as follows:

An Act to prevent the spreading of the small-pox or other infectious sickness.

Whereas the inhabitants of sundry towns in this province are often exposed to the infection of the small-pox and other malignant, contagious distempers, by persons coming from the neighbouring governments visited with such infectious sickness, and by goods transported hither that carry infection with them,—

*Be it therefore enacted by His Excellency the Governour, Council and Representatives in General Court assembled, and by the authority of the same,*

[Sect. 1.] That any person or persons coming from any place, in either of the neighbouring colonies or provinces, where the small-pox or other malignant infectious distemper is prevailing, into any town within this province, who shall not, within the space of two hours from their first coming, or from the time they shall first be informed of their duty by law, in this particular, give no-

tice to one or more of the selectmen or town clerk of such town, of their coming thither, and of the place from whence they came, shall forfeit and pay the sum of twenty pounds; and if any person or persons coming into any town of this province, from any such place visited with the small-pox or other infectious sickness, shall not, within the space of two hours, after warning given him or them for that purpose, by the selectmen of such town, depart out of this province, in such case it shall and may be lawful for any justice of the peace of such county, by warrant directed to a constable or other proper officer, to cause such person or persons to be removed, with any their goods that may probably give infection, unto the colony or government from whence they came; and any person remov'd by warrant as aforesaid, who, during the prevalency of such distemper, shall presume to return into any town of this province, without liberty first obtained from such justice, or from the selectmen of such town, shall forfeit and pay the sum of one hundred pounds.

*And be it further enacted by the authority aforesaid,*

[Sect. 2.] That any inhabitant of this province, who shall entertain in his house any person warned to depart as aforesaid, by the space of two hours after notice given him or her by one or more of the selectmen, of such warning, shall forfeit and pay the sum of twenty pounds.

*And be it further enacted by the authority aforesaid,*

[Sect. 3.] That it shall and may be lawful for the selectmen of any town or towns near to or bordering on either of the neighbouring governments, to appoint, by writing, under their hands, some meet person or persons to attend at ferrys, or other places, by or over which passengers and travellers coming from such infected places may pass or be transported; which person or persons, so

appointed, shall have power to examine such passengers and travellers as they may suspect to bring infection with them, and, if need be, to hinder and restrain them from travelling till licensed thereto by a justice of the peace within such county, or by the selectmen of the town into which such person or persons shall come; and any passenger, who, coming from such infected place, shall, without license as aforesaid, presume to travail or abide in this province after they shall have been cautioned and admonished, by the person or persons appointed as aforesaid, to depart, shall forfeit and pay the sum of twenty pounds, and be removed thence by warrant as aforesaid.

[Sect. 4.] The several forfeitures arising by virtue of this act, to be one moiety to and for the use of the town where the offence shall be committed; the other moiety to him or them who shall inform and sue for the same, in any of his majesties courts of record within this province.

[Sect. 5.] This act to continue and be in force for the space of three years, and no longer.

[*Passed June 15; published June 16, 1739.*]

In 1746, June, "The major part of the selectmen together with Thom$^{s}$. Barton & Sam$^{l}$. Barnard Esq$^{r}$. two of His Majestys Justices of the Peace for this County met on acc$^{t}$. of Peter Huxford who was sick of y$^{e}$ smallpox on board y$^{e}$ sloop "Wheel of Fortune" John Wakefeild master lately arrived from S$^{t}$. Eustatia also a boy on board s$^{d}$. sloop named William, who was likely to have that distemper, & sent the said Peter & William, by John Webb to y$^{e}$ care of y$^{e}$ Keeper of y$^{e}$ pest house on Rainsfords Island, & y$^{e}$ s$^{d}$. Justices ordered the said sloop up Forrest River under y$^{e}$ care of Cap$^{t}$. Woodbridge."

Town Meeting—May 11, 1747.

On reading and considering the report of y$^{e}$ Select

men which is as follows; "We in conformity to the vote of y^e^ town making us a comittee to consider of some sutable place for erecting a Pest House and making an estimate of the charge of such a house, have attended that service and are of opinion that Roach's point on the Neck is the most sutable place for that purpose, and that such a house may be erected & sutably finished at about the cost of seven hundred pounds old Tenor; which is humbly submitted, by order of y^e^ Selectmen

Benjamin Browne.

Salem, 11 May, 1747."

Voted, that y^e^ same be accepted, and that y^e^ sum of four hundred pounds, old Tenor, be paid out of y^e^ Town Treasury toward erecting said House, provided y^e^ sum of two hundred pounds, old Tenor, can be raised by subscription, towards perfecting y^e^ same.

Voted, that Roach's Point be y^e^ place for y^e^ erecting said House.

Voted, that M^r^. Stephen Putnam, Cap^t^. Jon^a^. Gardner, Benj^a^. Brown Esq., M^r^. John Procter Jun^r^., & Deacon Beckford be a committee to get the said subscription and to cause the said House to be erected, and to draw on the Treasurer for the said four hundred pounds & lay out y^e^ same with what shall be obtained by subscription for y^e^ purpose aforesaid.

[The subscription seems to have failed and on March 30, 1752, the proposal to build at the Town's charge is negatived in Town Meeting.]

In 1752 an act supplementing the provisions of the act of 1701 in some essential particulars was passed in these words:

An act in addition to an act made and pass'd in the thirteenth year of King William the third, intitled "An act providing in case of sickness."

*Be it enacted by the Lieutenant-Governour, Council and House of Representatives,*

[Sect. 1.] That when and as often as there shall be brought into any town within this province, whether it shall be from any other town within the province, or from parts without the province, any baggage, cloathing or goods of any kind soever, and it shall be made to appear by the selectmen of the town, or major part of them, to which such baggage, cloathing or other goods shall be brought, to the satisfaction of any one of his majesty's justices of the peace, that there is just cause to suspect such baggage, cloathing or other goods to be infected with the plague, small-pox, pestilential fever, or other malignant, contagious distemper, it shall and may be lawful for such justice of the peace, and he is hereby required, in such case, by warrant, under his hand and seal, directed to the sheriff or his deputy, or any constable of the town in which such baggage, cloathing or other goods shall be, requiring him to impress so many men as said justice shall judge necessary, to secure such baggage, cloathing or other goods to be secured, and said men to set and post as a guard and watch over the house or houses, or other place or places where such baggage, cloathing or other goods shall be lodged; which guard and watch are hereby required to take effectual care to prevent such baggage, cloathing or other goods being removed or intermedled with by any persons whatever, until due inquiry be made into the circumstances thereof; and in case it shall appear to the said justice highly probable that such baggage, cloathing or other goods are infected with the plague, small-pox, pestilential fever, or other malignant, contagious distemper, said justice is hereby impowred and directed to issue a warrant, under his hand and seal, directed to the sheriff or his deputy,

or the constable of the town where such goods, cloathing or baggage shall be, requiring said sheriff, deputy or constable to remove said baggage, cloathing or other goods, to some convenient house or place from whence there shall be the least danger of the infection's spreading, or being conveyed, there to remain until such baggage, cloathing or other goods shall be sufficiently aired, and until it shall appear to the satisfaction of the selectmen of the town where such baggage, cloathing or other goods shall be, that they be free from all infection; and said sheriff, deputy sheriff or constable, in the execution of said warrant, are impowred and directed, if need be, to break up any house, warehouse, shop or other place or places, particularly mentioned in such warrant, where such baggage, cloathing or other goods shall be; and in case of opposition or resistance, to require such aid and assistance as shall be necessary to effect the removal of such baggage, cloathing or other goods, and repel the force and resistance which shall or may be made thereto.

[Sect. 2.] And all persons are hereby required, at the commandment of either of the said officers having such warrant, under the penalty of forty shillings, to be recovered before the justice granting the same, to assist said officer in the removing said baggage, cloathing or other goods, unless they make an excuse to the satisfaction of such justice; and the charges of securing such baggage, cloathing and other goods, transporting and airing the same, shall be born and paid by the owners thereof, at such rates and prizes as shall be set and appointed by the selectmen of the town where such baggage, cloathing or other goods shall be; and in case of refusal, to be recovered by suit at law by all and every person and persons concerned and employed in and about the business of securing, removing and airing said baggage, cloathing or other goods.

*And be it further enacted,*

[Sect. 3.] That if need so require, any justice of the peace may, and is hereby impowred, on application to him made by the selectmen of the town in which such infected baggage, cloathing or other goods shall be, to make out a warrant to the sheriff of the county or his deputy, or constable of the town where such baggage, cloathing or other goods shall be, requiring said officer, with the advice and direction of the selectmen of said town, to impress and take up convenient housing or stores, for the receiving, lodging and safe keeping thereof, until the same shall be sufficiently aired, as aforesaid.

[*Passed January 30; published January 31, 1752.*]

This winter of 1751–2 seems to have been a peculiarly disastrous one. The Governor was addressed by the Legislature to appoint a fast for "distress of the Provinces, particularly Small Pox & Fevers;" houses, nurses, and other necessaries for the sick were impressed here, and gates established at the entrances to the town in accordance with the action of the Selectmen which follows. During this year attempts were made in Salem, through anonymous letters, to communicate the small pox to the family of Judge Lynde, afterwards Chief Justice of the Province, and a large reward of £ 500 old tenor was offered, and an Executive proclamation issued for the detection of the offenders.

"At a meeting of y$^{e}$ selectmen of Salem, March 25, 1752, all present.

Agreed that y$^{e}$ Clerk forthwith Issue Warrants for a meeting of y$^{e}$ Freeholders & other Inhabitants of said Town, at y$^{e}$ Town House on y$^{e}$ 30th instant at two of y$^{e}$ clock afternoon, at y$^{e}$ request of Epes Sargent Esq. & others, To consider the great hazard, y$^{e}$ s$^{d}$ Inhabitants are now in of being infected with y$^{e}$ small pox which prevails

in y^e^ town of Boston, & in many parts abroad; and if they shall see meet, to order a House to be built at y^e^ charge of y^e^ town in some suitable place & fit for y^e^ reception of all such as may be visited with any Infectious sickness, & to do whatever else y^e^ town shall judge necessary or prudent for preserving y^e^ said Inhabitants from y^e^ said Infection, at this juncture."

"At a meeting of y^e^ Freeholders & other Inhabitants of y^e^ Town of Salem, lawfully qualified to vote, March 30th, A. D. 1752.

Voted, Col. Ichabod Plaisted, Moderator of this meeting.

It being put to vote, whether it was y^e^ mind of y^e^ Town that y^e^ Selectmen should take all proper measures to prevent y^e^ spreading of y^e^ small pox in case it should come amongst them, it past in y^e^ affirmative.

It being put to vote whether they would order a House to be built at y^e^ charge of y^e^ Town, in some suitable place, & fit for y^e^ reception of all such as may be visited with any Infectious sickness, it past in y^e^ negative.

Voted & Order'd, that the Selectmen forthwith erect a Fence across y^e^ highway at y^e^ Town Bridge, and y^e^ highway by y^e^ South Mills & such other places as they shall think proper; and that they appoint one or more proper person or persons, as a watch & Guard at each of those places, & direct them carefully to examine every person who shall attempt to pass there, and if He, she, or they come from Boston or any other place visited with the small pox, and for that or any other reason the Guard shall judge it probable y^e^ inhabitants of this Town would be in danger by such persons coming into Town, & having that Infectious Distemper communicated to them, Then to stop & hinder such person or persons, from passing y^e^ s^d^ way, or coming into Town any other way, till they have y^e^ advice & permission of y^e^ Selectmen. And that y^e^ town

will indemify y^e^ Selectmen and also y^e^ Guards to be by them appointed, from all cost, charge & damage which shall arise herein.

Voted, that the Selectmen be directed to apply to the Great and General Assembly as soon as may be, and pray that such acts & laws may be made & passed in addition to those already provided in case of sickness, as shall be judged necessary to secure the Inhabitants of this town from all infectious distempers and prevent y^e^ spread of y^e^ same in case any person should be visited therewith. And that the s'd Selectmen may joyn with y^e^ Selectmen of Marblehead, or such as are appointed by that town, in petitioning said Great & General Court for y^e^ purpose aforesaid."

"At a meeting of y^e^ inhabitants of y^e^ town of Salem and of y^e^ District of Danvers qualified to vote in y^e^ choice of Representatives, at y^e^ Court House in Salem, May 18th, 1752.

The Selectmen of said town of Salem being present,

It being put to vote, whether they would make choice of any person to represent them in y^e^ Great & General Court, appointed to be held at Concord on the twenty seventh instant, pursuant to a precept for this purpose, it past in y^e^ negative.

Voted, that the Honourable the House of Representatives next to be assembled, be desired not to lay any fine on said inhabitants for not sending a Representative for y^e^ following reasons, viz^t^.—

First, For that it's not owing to any disrespect or design'd affront to that Hon'ble House.

2^dly^ Because by y^e^ late division of s^d^ town of Salem it's at this juncture especially impracticable to choose Representatives consistent with y^e^ peace of y^e^ said inhabitants.

3^dly^ In as much as y^e^ small pox is in several of y^e^ fam-

ilys of said town and it's probable will spread, the said Hon[l] House would be in great danger of having that infectious distemper communicated to them by y[e] Representatives of s[d] inhabi[ts] if any such were chosen, and

4[thy] As it's probable y[e] s[d] distemper will spread in said town, and thereby very heavy charges occur to y[e] inhabitants they think in that case many of said inhabitants will be unable to bear y[e] charge of sending a Representative.

Voted, that a copy of these votes accompany y[e] precept."

By Chap. III of a Session begun May 25, 1757, the quarantine legislation was further perfected. The act was as follows:

An act in addition to an act intitled: *An act for regulating the hospital on Rainsford's Island, and further providing in Case of Sickness.*

Whereas in and by an Act Intitled, *An act for regulating the Hospital on* Rainsford's Island, *and further providing in Case of Sickness, it is provided, That "when and so often as any Ship or other Vessel, wherein any Infection or infectious Sickness hath lately been, shall come to any Port or Harbour within this Province; or when and so often as any Person or Persons, belonging to or that may, either by Sea or Land, come into any Town or Place near the public Hospital within this Province, shall be visited with any infectious Sickness; two of the Justices of the Peace or Select Men of such Place, be and hereby are impowred immediately to order the said Vessel and sick Persons to the Province Hospital or House aforesaid, there to be taken Care of:"*

*But no Penalty is annexed to the Breach of the aforerecited Paragraph of said Act:* Wherefore, Be it enacted by the Governour, Council and House of Represen-

tatives, That when any Ship or other Vessel, wherein any infectious Sickness is, or hath lately been, shall come to any Port or Harbour in this Province, and either two Justices or the Select-Men of the Place shall order the said Vessel to the Province Hospital; and the Master or Mariners of such Vessel, shall refuse or delay by the Space of six Hours after said Order, given to said Master or either of the Owners of said Vessel, or of the Factors of either of said Owners, to come to sail, if Wind and Weather permit, in order to proceed to said Hospital, the Master of said Vessel shall forfeit and pay the Sum of *One Hundred Pounds*, and suffer six Months Imprisonment; one half of said fine to be to the Informer or Prosecutor, and the other half to the Poor of the Town or District, to which such Port or Harbour belongs; the Offender to be prosecuted in any Court of Justice proper to try the same.

Again, in 1764, Salem was fenced off from her neighbors by the Selectmen, Jany. 21, and a watch ordered, but these precautions were suspended March 8th, and one thousand persons had the disease by voluntary inoculation, out of a population of forty-four hundred.

"At a meeting of the Selectmen of Salem August 24th, 1772, all present.

The selectmen being informed that Cap$^{t}$ John Batton had arrived at Salem in a vessel from abroad, & that one of his hands on board was sick of the small pox—

Agreed that an order be sent to said Batton in the form following, viz$^{t}$

"To Capt. John Batton,

Sir, We as selectmen of Salem being impowered & directed by the laws of this Province to take care for preventing the spreading of infectious diseases, more particularly in the case of vessels coming from abroad;

pursuant to said Laws we hereby direct & require you, with all convenient speed, to proceed with your vessel from hence to Rainsford Island, where proper houses & accommodations are provided for the reception of your men infected, or in danger thereof, & for cleansing them and the vessel & goods on board; and you are to take care that none of your men, nor yourself, come on shore here, as you & they would avoid the penalties of the Laws in this case provided. Given under our hands at Salem this twenty fourth day of August, 1772.

(signed) GEORGE DODGE,
GEORGE WILLIAMS,
JOHN FELT,
JOHN GARDNER, 3d,
TIM'Y PICKERING, junr."

[The above order was given the same day to Richd. Derby, junr., Esqr., to be delivered to said Batton; who proceeded as therein was required.]

We now approach the period at which the general treatment of small pox by wholesale inoculation prevailed. Salem had, by the first census,—that of 1765,— a population of forty-four hundred and twenty-seven souls, five hundred and nine houses, and nine hundred and twenty-three families, and, by the next colonial census of 1786, a population of fifty-three hundred and thirty-seven. Marblehead was as large. October 19, 1773, was opened by Elbridge Gerry, afterwards Vice-President of the United States, and others, on Cat Island, in Salem Harbor, near Marblehead, the first general hospital for inoculation known to have existed in New England, and, it has been also claimed, the first in the country. This establishment accommodated classes of one hundred or more, who remained under treatment four or five weeks. After a few months of success, it was burnt by a mob. Meantime

another similar establishment, like the first a private enterprise, was opened in the Great Pasture near Castle Hill in Salem, Dec. 9, 1773, with a class of 132 patients, a second class of 137 following Jan. 7, 1774, and inoculating hospitals soon became a common and favorite measure of prevention in this region. So virulent was the type of the natural disease prevailing here that winter that sixteen out of twenty-eight persons, suffering with it at the pest-house, died. March 14, 1774, the inhabitants of Salem voted to withdraw the license granted the proprietors of this Hospital for inoculation because the Suttonian or English method there practised had lost caste, to reimburse them for their outlay and to assume the establishment as public property. I take from the Town Records some account of the regulations under which it was conducted. One of the Selectmen was Timothy Pickering, afterwards Adjutant General of the Revolutionary Army and Secretary of War under Washington.

Meeting of Inhabitants of Salem at the Court House there, Sept. 29, 1773, at 4 o'clock in y$^{e}$ afternoon.

"Voted, that a committee of nine persons be chosen to assist the Selectmen, in stopping the spread of the small pox and removing those who break out with it."

"Voted, John Prince, Benjamin Pickman Esq., John Warden, Richard Derby Jun$^{r}$ Esq., Cap$^{t}$ Jon$^{a}$ Mason, Abraham Watson, Capt. Will'm Pickman, David Mason, & Richard Ward, be the above committee."

"Voted, that the Selectmen be directed to take up and use as many houses as they think necessary for removing those persons who may be infected or break out with the small pox."

[In the autumn of this year an order was cried by Thomas Heather, the town-crier, requiring that cats & dogs be killed, as a precaution against the spread of small-pox.]

Town Meeting, Novem. 1st., 1773.

The Committee chosen at the town meeting of October 27th, made report in the following words, to wit. The Committee appointed by the town at their meeting on the 27th *instant* to consider of a proper place, and to draw up Restrictions & Regulations for inoculating, and to make report thereof to the town, at the adjournment, Report as follows, to wit,—

1. That a Hospital be erected at the southeast corner of the Great Pasture near the land set off from it to the late Co[l]. Pickman, on such a spot as the committee shall judge most suitable.
2. That the Hospital be built and furnished by the subscribers and in such manner as they, at a meeting warned for that purpose, shall direct.
3. That in like manner the subscribers shall appoint a committee for building the Hospital, and a Physician or Physicians to attend it.
4. That Overseers be appointed by the town, to manage and direct all the affairs of the Hospital.
5. That before the Hospital be opened, the Overseers shall appoint suitable nurses, cleansers, guards and tenders.
6. That a fence shall be set up at a proper distance from the Hospital; and on some convenient spot, twenty feet distant from the fence, a bar shall be erected; and the guards shall suffer no communication between persons at the Hospital & others, but at that spot and distance.
7. That the guards shall permit none to leave the Hospital, till the cleanser hath certified that they have been properly cleansed and shifted.
8. That the cleanser shall not himself go into, nor suffer others to enter, the clean Room during their residence at the Hospital, and when any persons are

ready to shift, the cleanser shall attend them to the shifting room, and there receive all the apparel worn by such persons during their residence at the Hospital, and after washing and fumigating shall admit them into the clean room, there to put on clean apparel & be discharged; the foul cloaths to be sufficiently washed and cleansed, and then returned to the owners.

9. That one of the guards shall never enter the Hospital; and to him the tenders shall deliver the supplies, at the Bar, beyond which they shall never go; nor handle anything that is brought from the Hospital.
10. That nothing shall be received from the Hospital without the cleanser's allowance; or delivered at the Hospital but by or under the inspection of the Guard.
11. That the nurses, tenders, guards & cleansers shall give bond, to the satisfaction of the Overseers, for the faithful observance of these Regulations, and such others as, for the general good, the Overseers shall from time to time think best to establish.
12. That every ten pounds subscribed shall intitle the subscriber to the admission of one person of his appointment in the first class; and the same Rule shall be observed with all other subscribers, in the same or any succeeding classes, in proportion to the sums they subscribe, such subscription not being less than ten shillings each. And persons subscribing less than ten shillings, and all others who pay their own charges of inoculation, shall be next admitted; & all such admissions shall be by lot, if more apply in any class than the Hospital will accommodate.

13. That on admission each patient shall pay to the Treasurer . . . . for the Doctor's fee; and . . . . . for defraying the other necessary expences of inoculation; and twelve shillings towards paying for the house & furniture, and raising a fund for inoculating the poor. And if these sums should exceed the real charges of inoculation, the surplusage shall go to the Poor's fund.
14. That the Overseers of the Hospital, with the advice of the Overseers of the Poor of the town, shall determine what persons shall be inoculated gratis, or for less than is stated in the thirteenth Article.
15. That no person belonging to other towns shall be admitted into the Hospital to the exclusion of town inhabitants.
16. That a Bond of fifty pounds penalty (but without sureties) shall be given to the Treasurer for each patient to secure the observance of these Regulations, and such others as shall be made by the overseers as before mentioned.
17. That a Treasurer of the Hospital be appointed by the town, & obliged by Bond, to the satisfaction of the Overseers, to observe the duties of him required by these Regulations.
18. That the Treasurer give a receipt to each subscriber upon his payment of the money subscribed.
19. That the committee for building and furnishing the Hospital, draw upon the Treasurer for what monies they need; but that the Treasurer make no other payments without order from the overseers; and that he account with them from time to time, at their request, for all monies by him received.

20. That whenever requested the Treasurer and Overseers shall lay all the Hospital Accounts and transactions before the town for examination.

All which is submitted by

Abra$^{m}$ Watson
Rich$^{d}$ Ward
Elias Hasket Derby
Barth$^{o}$ Putnam
} The Committee.

[Note. Co$^{l}$. Benj$^{a}$ Pickman the other of the Committee was out of town when the foregoing report was made.]"

The foregoing Report, having been read, was accepted; and the twenty articles thereof were voted, one by one.

Voted, that there be five Overseers to manage and direct all the affairs of the Hospital. Then the following persons were chosen Overseers by five several votes, in the order they here stand. Jonathan Gardner jun., Stephen Higginson, Timo. Pickering jun., John Prince & William Pickman.

Voted, Benjamin Pickman Esq. Treasurer of the Hospital."

[March 14, 1774, the town assumed the Hospital as public property.]

Town meeting, March 17, 1777, at 9 o'clock in the morning.

"Voted, that the Hospital in the great Pasture be opened for inoculating for the small pox."

"Voted, that a committee be chosen to draught regulations for the above Hospital."

"Voted, that this Comm. consist of five persons viz: Bart$^{w}$ Putnam, Nath$^{l}$ Whittaker, Jacob Ashton, John Andrew & W$^{m}$ Wetmore."

Town Meeting, March 18, 1777.

"Voted, that five persons be chosen as overseers of the

Hospital for innoculating for the small pox & the following persons were chosen, viz: Jonathan Peele j$^{r}$, John Gardner y$^{e}$ 3$^{d}$, Capt. Sam$^{l}$ Williams, Rich$^{d}$ Ward, & Rich$^{d}$ Manning.

"Voted, that one person be a Comm$^{e}$. to wait on Doc: Holyoak to ask his present attendance here & that Nathan Goodale be this person."

"Voted, that a treasurer be chosen for the Hospital."

"Voted, that Joseph Henfield be this Treas$^{r}$."

"Voted, that the town make choice of Edw$^{d}$ A. Holyoak Esq. as a physician to take care of the Hospital for innoculating for the small pox."

"Voted, that the overseers treat with Doc. Holyoak respecting the terms in his attending at the hospital."

"Voted, that the twenty one Articles now read to the town respecting the Hospital be adopted & accepted."

Town Meeting, Mch. 21, 1777.

"Voted, that an addition of one person be added to the Overseers for the Hospital for innoculation for the small pox, & that John Gardner be this person."

"Voted, that the town impower the overseers of the Hospital to make application to three Justices, or if 'tis found necessary to the Court of Sessions within this County for liberty to open s$^{d}$ Hospital."

"Voted, that this meeting be adjourned to the 10$^{th}$ of April next, & that the town then consider those seventeen setts, or Rooms who applied to go in to the Hospital, but was excluded by lot, whether they shall have the preference to any other of the inhabitants of the town."

Town Meeting, April 10, 1777.

"Voted, that those seventeen setts of persons who applied to go into the Hospital, but was excluded by Lot, shall not have any preference as to admission any more than any other inhabitant of this town."

[March 28, 1777, a class of 149 was admitted; May 2, a class of 227; and June 5, a third class of 214.]

Meeting of Selectmen, May 30, 1777.

"Order'd that the town clerk forthwith issue out Warrants to warn the freeholders, & other inhabitants of the town of Salem, lawfully qualified to vote in town affairs, to assemble at the town house, on Monday, the second day of June next, at nine o'clock in the forenoon,— to consider & determine upon the petition of Ichabod Nicholls & others whether the town will consent that a general innoculation for the small pox shall take place throughout the town, or any part thereof, or whether they will do any thing respecting that matter."

Town Meeting, June 2, 1777.

"The question was put whether the town will consent that a general innoculation for the small pox shall take place, throughout the town, & it unanimously passed in the negative."

"Voted, that a certain number of houses in the town be taken up for the purpose of innoculation."

"Voted, that three persons be a committee for the above purpose." "For this Committee Geo: Crowningshield, Benj[a] Ward, & Sam[l] Williams."

"Voted, that the above Comm. post up notifications desiring all persons (inhabitants of Salem) who have a mind to receive the small pox by innoculation to give in their names to the Comm: chosen for that purpose."

"Voted, that y[e] report of the Comm. to take up Judge Lynde's Castle hill house for innoculation be not complied with."

Our Maritime importance was promptly recognized at the outbreak of the Revolution as it had been in the previous French war. Washington took command of the armies at Cambridge, July 3, 1775, and without awaiting

the tardy movements of Congress, at once applied himself to extemporizing a navy. To this end he sent agents to Salem, Beverly, Marblehead and other ports to search out able seamen and fast sailing craft, and commissioned these to "take and seize all such vessels as are employed for the purpose of aiding and assisting the ministerial troops or navy." We fitted out in this war at least one hundred and fifty-eight private armed vessels from Salem carrying probably 2000 guns, and of this fleet, which brought in about four hundred prizes, we lost fifty-four sail. The tonnage of Salem declined from 9,223 tons in 1771 to 8,652 tons in 1781, but it increased so rapidly after the close of the war as to have nearly doubled in a decade and to have reached in 1800, twenty-five thousand, and in 1807, forty-three thousand six hundred tons. Our brilliant commercial period dates from the close of the Revolutionary War, and doubtless the impetus which our extensive privateering gave to seamanship and ship-building explains its origin. The adoption of the Federal Constitution seems to have given it another impulse, and probably the turbulence prevalent in Europe, during the wars of the French Revolution, helped our commerce. Until the war of 1812, it left no check. Before 1789, Elias Hasket Derby's barque "Light Horse" had opened American trade with St. Petersburg, leaving port June 15, 1784; his ship "Grand Turk" with the Isle of France and China, clearing, Nov. 28, 1785; in 1787–8 his ship "Atlantic" was the first American craft to display our flag at Surat, Bombay, and Calcutta.[3] By the census of

[3] One of his vessels is claimed to have been the first to show the stars and stripes at Siam, and on April 26, 1798, his ship "Recovery," Capt. Joseph Ropes, master, left Salem for Mocha, arriving there Sept. 9, in advance of all other American vessels. Salem vessels were the first to display the American flag at the Island of Java, in 1796; and Nov. 3, 1795, the schooner "Rajah," of 130 tons burthen, carrying four guns and ten men, built for Jonathan Peele and commanded by Capt. Jonathan

1790, Salem had a population of seventy-nine hundred and twenty-one; by that of 1800, a population of ninety-four hundred and fifty-seven. In 1812, we had eight hundred seamen afloat, and imperilled by the declaration of war, in a population of less than thirteen thousand.

Notwithstanding these new commercial relations our Quarantine system modified itself but slowly and little was done save under the pressure of sudden epidemic. Licensed tenements were still resorted to as late as 1792 for the treatment of the small pox by inoculation, as appears from votes which follow, and for several years after, there was great uneasiness, manifested in legislative resolves, executive proclamations and local regulations, on account of the threatening approaches of yellow fever. General inoculations were common, down to the introduction of vaccination in 1796. These prevailed during the British occupation of Boston and New York. Gen. Washington was inoculated at New York June 27, 1776, and may have submitted to something like the heroic treatment by Glauber's salts, pill-cochiæ, emetics, Indian meal gruel with molasses, and drum and fife exercise, which prevailed at the general hospitals of that day.

Town Meeting, Oct. 19, 1792.

"Voted, that the Barracks at the New Fort (so called) be licensed to be open for inoculation for the small pox, together with the house now improved by M$^{r}$ Perkins on the Neck (so called) subject to such Restrictions & Regulations as may hereafter be agreed on.

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Carnes, cleared from Salem under secret orders, leading the way to the Island of Sumatra, threading unknown seas without chart or pilot, the pioneer of a great flotilla, and getting off with the first cargo of pepper in bulk ever brought to this country. Joseph Peabody's ship "Franklin" from Boston, commanded by Capt. James Devereux of Salem, was the first American vessel to open trade with Japan, and the second to enter was the ship "Margaret" of Salem, Capt. Samuel Derby, master, which left Salem harbor, Nov. 25, 1800, and July 19, 1801, fired her salutes in the port of Nagasaki.

Voted, that the house of Joseph Metcalf be licensed to be open for inoculation for the small pox to be under such restrictions & regulations as may hereafter be agreed on.

Voted, that the two houses at Castle Hill be licensed to be open for inoculation for the small pox, to be under such restrictions & regulations as may hereafter be agreed on.

Voted, that the farm house in South Fields owned by Col° Pickman & improved by M^r^ Boynton be licensed to be open for inoculation for the small pox to be under such regulations as may hereafter be agreed on.

That the Selectmen be impowered to open such houses for the purpose of inoculation for the small pox, as they may hereafter have occasion for & think necessary.

Voted, that a Committee be appointed to superintend the inoculation at the Neck, for the Barracks, Perkins's &c., such houses, & the patients, to be subject to such restrictions and regulations in every respect as they may prescribe, with the advice & consent of the Selectmen. For this Committee, Cap^t^ Edw^d^ Allen, Cap^t^ Benj. Ward & Cap^t^ Jon^a^ Mason.

That a Committee be appointed to superintend the inoculation at Castle Hill, M^r^ Metcalfs house, & Col° Pickmans farm house, together with such other houses as may hereafter be licensed by the Selectmen for inoculation for the small pox. The patients and such houses, to be under such restrictions & regulations in every respect as they may prescribe with the advice and consent of the Selectmen.

For this Committee M^r^ Jn° Norris, Jn° Treadwell Esq., M^r^ Nat Ropes, Deacon Holman and Deacon Sanderson."

At last, in 1797, probably under the stress of this yellow fever panic, quarantine regulations were placed on a new

footing by an act, passed June 22, repealing much of the earlier legislation, codifying the rest of it, and establishing a system which, with some modifications, has endured. I omit this act, which may readily be referred to [Chap. XVI, of 1797,] because many of its provisions, bearing upon the health of Salem, were embodied, two years later, in a special act for this town, which I insert. The latter was drawn by the Hon. William Prescott, and became a law simultaneously with a similar act for the town of Boston, June 21, 1799. Since the passage of this act and the modification of it which follows, passed June 16, 1800, little change has been made in the State quarantine legislation touching Salem, and such modifications of detail or method as have occurred seem to be without interest for the historical student.

[Acts of 1799, Chap. xiii.]

An act to empower the Inhabitants of the Town of *Salem* to choose a Board of Health, and for removing and preventing Nuisances in said Town.

[Sect. 1.] *Be it enacted by the Senate and House of Representatives, in General Court assembled, and by the authority of the same*, That the freeholders and other inhabitants of the Town of *Salem*, qualified to vote for Town Officers, may on the first Monday of *April* annually, or at any other meeting legally called for the purpose, choose a Board of Health, consisting of nine persons, not less than two of whom shall be chosen out of each Ward in said town; the members of which Board of Health shall elect a President, and a Clerk whose duty it shall be to record the votes and doings thereof; and in case of the death or resignation of any one of the members of said Board, the said freeholders or other inhabitants may, at

any meeting legally called for the purpose, elect a member out of the same Ward, to supply his place.

[Sect. 2.] *Be it further enacted*, That it shall be the duty of the Board of Health, and each member thereof, to examine into all nuisances and other causes injurious to the health of the inhabitants; whether the same shall be caused by stagnant waters, drains, common sewers, slaughter-houses, tan-yards, fish, fish-houses, docks, necessaries, hog-sties, putrid animal or vegetable substances, or any other cause of whatever kind, which in his or their opinion may be injurious to the health of the inhabitants as aforesaid. And upon complaint on oath being made to any Justice of the Peace by any member of said Board of Health, or other person, that he suspects any of the nuisances or causes aforesaid to exist in any dwelling-house, cellar, store, other building, ship or vessel, it shall be the duty of such Justice to issue his Warrant, directed to the Sheriff of the County of *Essex* or his Deputies, or to any Constable of the town of *Salem*, commanding him or them forcibly to enter, and, together with a member of said Board of Health, to search the same in the day time, and upon the discovery of such nuisance, or other cause, injurious to the health of the inhabitants, to remove the same.

*Provided however*, That no Sheriff, or Deputy Sheriff, or Constable, shall execute any civil process, either by arresting the body or attaching the goods and chattels of any person or persons, under color of any entry made for the purposes aforesaid, unless such service could by law have been made without such entry; and all services so made under color of such entry, shall be utterly void, and the officer making such service shall be considered as a trespasser to all intents *ab initio*. And any person or persons who shall resist such search, shall forfeit and pay the sum of *twenty dollars*, to be recovered in manner hereinafter provided. And it shall be the duty of the Board of Health, upon the discovery of any such nuisance or

other cause injurious to the health of the inhabitants of said town, forthwith to remove the same; and upon complaint to any Justice of the Peace within the said town or in said County, made upon oath by one or more of the said Board of Health, briefly therein stating the facts, together with the costs of such removal, such Justice shall grant a Warrant, therein expressing the substance of the said complaint, directed to the Sheriff of the County of *Essex*, or his Deputy, or any Constable of the town of *Salem*, commanding him to notify and require the person or persons in whose possession, or upon whose estate such nuisance or other cause aforesaid existed; or in case of his absence, his agent or attorney, to appear forthwith before such Justice; and if such person or persons shall neglect then and there to appear, or appearing shall not shew good cause, to the satisfaction of said Justice, why judgment should not pass against him or them; the said Justice shall then and there adjudge that such person or persons shall pay a fine of *thirteen dollars*, and the costs of such removal, and double costs of prosecution; and shall thereupon issue his Warrant, directed to the Sheriff of the county of *Essex*, or his Deputy, or any Constable of the town of *Salem*, thereby commanding him to levy the expence of said removal, together with said fine and double costs, on the goods and estate, and for want thereof, on the body of the said occupier or proprietor of the house, land, cellar, docks, store or vessel in which said nuisances existed; and said fine shall be paid over to the Town Treasurer for the use of the said town. *Provided always*, That any person or persons aggrieved at any judgment of a Justice, passed against him or them, as aforesaid, shall have a right to appeal therefrom, to the Court of General Sessions of the Peace, then next to be holden within and for the County of *Essex*, who shall hear and determine on such complaint, with or without the intervention of a Jury, as the case may require, and thereupon render such judgment as the Justice is herein before authorized to do in an original complaint

to him, with additional costs; and the judgment of said Court thereon shall be final. *Provided nevertheless*, That no such appeal shall be granted, unless the respondent shall claim the same on the day on which the Justice's judgment shall be rendered, and shall enter into recognizance with two sufficient sureties to prosecute said appeal with effect. And said Board shall have authority to appoint Scavengers, and such other Officers to assist them in the execution of their office, as they shall judge necessary; for payment of whom, and all necessary expences which may arise in the exercise of their office, the said Board shall be authorized to draw upon the Treasurer of said town.

. . . . . .

[Sect. 6.] *Be it further enacted*, That whenever it shall appear to the said Board of Health, that the safety of the inhabitants of the town of *Salem* requires that any vessel or vessels, which shall arrive within the harbor of Salem from any port or place, should perform quarantine, the said Board are hereby required and empowered to cause such vessel or vessels to perform quarantine at such place as they shall appoint, and under such restrictions, regulations and qualifications as they may judge expedient; and any owner, master, or supercargo, officer, seaman or consignee of any vessel, or any other person, who shall neglect or refuse to obey the orders, directions, rules, regulations, restrictions, or qualifications of the said Board of Health respecting said quarantine, and shall be thereof convicted upon indictment, or information, before the Supreme Judicial Court, or Court of General Sessions of the Peace, held in said County of *Essex*, shall be fined a sum not exceeding *five hundred dollars*, or be imprisoned for a term of time not exceeding six months, or both, at the discretion of the Court, having cognizance of such offence.

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[Sect. 8.] *Be it further enacted*, That no master of a vessel, or other person, shall remove from any vessel in the

harbor, or lying at any of the wharves in *Salem*, any sick or diseased person, before the name of such sick or diseased person has been reported to the Board of Health, and a written permit obtained from at least two of them, authorizing such removal, and expressing the manner thereof, the time when, and the place to which such person shall be removed. And any master of a vessel, or other person, who shall remove such sick or diseased person, without first obtaining such permit therefor, or contrary to the tenor and directions thereof, shall, on conviction before the Court of General Sessions of the Peace, in said County, be fined a sum not exceeding *one hundred dollars*, or suffer imprisonment not exceeding two months, or both at the discretion of said Court.

. . . . . .

[Sect. 10.] *Be it further enacted*, That every diseased mariner or other person, who shall be removed or sent to any hospital or other place by the said Board of Health, shall be there kept and maintained at his or their own cost and expence, or his or their parent's or master's, (if able), otherwise at the charge of the town or place to which they belong, and in case such person or persons have no legal settlement in any town or place within this State, then at the charge of this Commonwealth; and every person sent to any Hospital or Place for the purpose of purification as aforesaid, shall be subject to the same restrictions as are provided by the seventh section of an Act of this Commonwealth, passed the twenty-second day of *June*, one thousand seven hundred and ninety-seven, entitled, "*An act to prevent the spreading of contagious sickness.*"

[Sect. 11.] *Be it further enacted*, That no person, excepting those employed by or under the Board of Health, shall go on board any vessel, during the time she is performing quarantine, nor shall any person go within a line designated upon the land, at the place appointed for cleansing and purifying vessels; and every person who

shall transgress in either of these cases, shall be considered as contaminated with infection, and held to undergo purification, in the same manner, and under the same regulations and restrictions, as those performing quarantine at such place, and shall there remain until discharged by the visiting Physician ; and the said Physician, or the person employed by the Board of Health, to superintend such place, may forcibly detain such person.

[Sect. 12.] *Be it further enacted*, That if any vessel subject to quarantine, shall come into the harbor of *Salem*, it shall be the duty of the Board of Health, or any two of them, to order the master or person, having the command of said vessel, immediately to proceed with her crew, passengers and cargo, to the place by them appointed for cleansing and purifying vessels ; and in case the said master or person, having the command of said vessel, shall refuse or neglect so to do for the space of one hour after said order, he shall, on conviction before the Supreme Judicial Court, or Court of General Sessions of the Peace, forfeit and pay a fine not exceeding *one thousand dollars*, or suffer imprisonment not exceeding six months, or both, at the discretion of the Court; and the said Board of Health, or any two members thereof, on any neglect or refusal as aforesaid, shall have full power and authority forcibly to enter on board such vessel, and to require the assistance of as many persons as they shall judge necessary, and proceed with said vessel, her crew, passengers and cargo to the place appointed for cleansing and purifying vessels ; the expence of which removal shall be paid by the owner of such vessel, and shall and may be recovered by an action of the case in any Court competent to try the same ; and any person who shall refuse to give his assistance when required, shall forfeit *thirteen dollars*, to be recovered by an action of debt.

[Sect. 13.] *Be it further enacted*, That all the powers and duties which are given to and required of the Se-

lectmen of the town of *Salem*, by a certain law of this Commonwealth, passed the twenty-second day of *June*, one thousand seven hundred and ninety-seven, entitled "An Act to prevent the spreading of contagious sickness," shall be, and they hereby are transferred to and made the duty of the said Board of Health, anything in said law to the contrary notwithstanding.

[Sect. 14.] *Be it further enacted*, That the said Board of Health, be, and hereby are empowered from time to time, to choose a suitable and discreet person to act as a visiting Physician to said Board; whose duty it shall be to visit all vessels coming from any place or places in which the said Board shall think any contagious sickness prevails; and such Physician shall be under direction of said Board, and may be removed by them, whenever they shall see cause.

And whereas by the eleventh section of the Act of this Commonwealth, entitled, "An Act to prevent the spreading of contagious sickness," it is enacted, that each town and district in this Commonwealth, may at their meeting held in *March* or *April* annually, or at any other meeting legally warned for that purpose, when they shall judge it to be necessary, choose and appoint a Health Committee, in the manner and for the purposes in said eleventh section mentioned.

[Sect. 15.] *Be it enacted*, That so much of said law as respects the future appointment of a Health Committee for the town of *Salem*, be, and the same is hereby repealed, and that the Board of Health to be appointed by virtue of this Act, be, and they hereby are made and shall be the Health Committee for the town of *Salem*, and be invested with all the powers and duties, which are granted to or imposed upon said Health Committee in and by said Act.

[Sect. 16.] *Be it further enacted*, That all penalties and forfeitures arising from this Act, except in those cases in which it is herein otherwise provided, shall accrue to the

use of the town of *Salem*, and shall be prosecuted and recovered by action of debt in the name of the President of the said Board of Health, or by information in any Court competent to try the same. And it shall be the duty of the Board of Health and of each member thereof, to pursue and enforce the due execution of the foregoing law, and prosecute all offenders for all penalties and forfeitures which may accrue under the same.

[*This Act passed June 21, 1799.*]

[Acts of 1800, Chap. xx.]

An Act in addition to an act, entitled, "An Act to empower the inhabitants of the Town of Salem to choose a Board of Health, and for removing and preventing nuisances in said Town," and for repealing part of said Act.

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[Sect. 2.] *Be it further enacted*, That any master or commander of any vessel, who shall enter the harbour of *Salem* with his said vessel, after notice given to him by any person or persons whomsoever, that quarantine has been directed by said Board of Health for all vessels coming from the port or place from which such master or commander shall have arrived, or who shall falsely or fraudulently attempt to elude the directions of the said Board of Health, by false and unfounded declarations of the port or place from whence he came, or as to the sickness or deaths which may have happened on board said vessel, during her then last voyage, or who shall land, or suffer to be landed from his vessel, any person or apparel, bedding, goods, or merchandize whatsoever, without the permission of the said Board of Health, every such master or commander, shall, upon conviction thereof in manner and form pointed out in the sixth section of the act to which this is an addition, forfeit and pay a sum not exceeding *five hundred dollars*, or suffer imprisonment for

a term not exceeding six months, or both, at the discretion of the court having cognizance of the offence.

[Sect. 3.] *Be it further enacted*, That whenever the visiting Physician of the Board of Health, shall think it necessary that any vessel should be purified and cleansed and perform quarantine, he, or any other person authorized thereto by the Board of Health, may direct the master or commander of such vessel to proceed to, and anchor at such place as the said Board of Health shall have appointed for cleansing, and purifying vessels: And it shall be the duty of said Physician to apply to the Board of Health to direct the time and manner in which such purification shall take place, and the expenses shall be defrayed by the master, commander, owner or consignee, to be recovered by an action of the case in the name of the President of the Board of Health; and each and every master, commander, owner or consignee of every such vessel, who shall neglect or refuse to comply with such directions, shall, on conviction thereof, before the Court of General Sessions of the Peace, be fined, not exceeding *one thousand dollars*, or suffer imprisonment for a term, not exceeding six months, or both, at the discretion of the Court.

[Sect. 4.] *Be it further enacted*, That all pecuniary penalties and forfeitures, arising from this act, shall accrue to the use of the town of *Salem*, and shall be prosecuted for, and recovered by action of debt in the name of the President of the said Board of Health in any Court competent to try the same, excepting in those cases in which it is herein otherways provided: And that the fourth, seventh, and ninth sections of the act to which this is an addition, be, and the same are hereby repealed, excepting so far as respects the recovery of any fines, or forfeitures already incurred thereby.

[*This Act passed June 16, 1800.*]

I hesitate to extend this statement further because I find nothing in the modern record which is distinctive or

characteristic of the place. Of course, in common with the country at large, in 1831–2, we had our cholera scare, but the distemper gained no foothold. Salem accepted a City Charter in 1836, and, in 1839, passed a Health Ordinance which has been in operation with little amendment since. Under the act of 1799, a Board of Health was at once established, July 1, and, July 5, a new Health House at Watch House Point had been contracted for, a Port Physician engaged, a boat bought, quarantine established at the Junipers, and two boarding officers secured. The board met every Monday morning at eight o'clock at the Court House, and showed commendable zeal and vigor in combating the approach of "Disorders from abroad." They describe this as the "primary object" of the act and resolve by vote that "they will see the act in full effect," especially as regards quarantine, "that part of their duty which is disagreeable and expensive." Now it is arrivals from "Philadelphia or any port within the Deleware," now from "Gibralter and the Mediterranean," now "from Havana and St. Thomas," and again "from the Chisapeak," which give occasion for their vigilance. But the modifications of the system which have from time to time occurred, and the measures taken by our Board of Health from that day to the present have been so substantially in accord with those adopted all over the country, and especially in seaport towns of about our own size, that I do not feel at liberty to extend this already protracted account by a recital of them.

I am, Gentlemen, very respectfully
and truly yours,
ROBERT S. RANTOUL.

Salem, March, 1882.

# BULLETIN

OF THE

# ESSEX INSTITUTE.

VOL. 14. SALEM: APRIL, MAY, JUNE, 1882. NOS. 4, 5, 6.


REGULAR MEETING, MONDAY, JANUARY 16, 1882.

MEETING this evening. The PRESIDENT in the chair. Records read. Donations and correspondence announced.

MR. JOHN H. SEARS read a communication on "The Forest Trees of northern New York;" a continuation of his remarks at a previous meeting (Monday, Dec. 19, 1881). The subject was discussed by Messrs. F. Israel, D. B. Hagar, R. C. Manning, John H. Sears, and the chair.

The chair alluded to a recent communication from the Secretary of the Virginia Historical Society, announcing the gratifying intelligence of its good fortune in obtaining ample accommodations for the arrangement of its library and collections; also its intention of renewing its publications, in printing some of the valuable manuscripts in its possession relating to the early history of the Old Dominion, and of many of its illustrious sons who took a conspicuous part in the formative period of this republic of states.

After a consideration of the subject of a Winter Field Meeting, adjourned.

## Regular Meeting, Monday, Feb. 6, 1882.

At the meeting this evening, Messrs. Lawrence E. Millea of Salem, and George Plumer Smith of Philadelphia, were elected members.

## Winter Field Meeting.

On Saturday, Feb. 11, at a little after ten o'clock A. M., a party of some fifty persons left Plummer Hall in two open sleighs for Wenham Lake. The day was brilliantly fair, the going fine, and, but for the two postponements necessitated by the great snowstorms of the preceding week, the attendance, as indicated by applications for places, would have been much larger. Arrived at the Lake at about eleven o'clock, an hour was passed in observing the various processes of cutting, gathering and storing ice. Large and hurried operations were in progress, since the ice-crop was a little late this season, and the Lake, its crystal surface sparkling in the noonday sun, presented a unique and busy scene. Every possible facility was extended in the most hospitable spirit by Mr. Durgin, the local agent, and by the employés, who conducted the business of harvesting the crop for Messrs. Addison Gage & Co. Other firms own ice-houses at the southern end of the Lake where large gangs of men were at work, but these were not visited.

The number of men and horses employed during the winter at Wenham Lake depends upon the quantity of snow which may fall. The winter of 1881–2 was exceptional as to its snow-fall, the two storms of January 31 and February 4 aggregating thirty inches on a level.

During the scraping, which continued almost uninterruptedly from the day the ice was thick enough to bear a horse until the last block was housed, about seventy horses and one hundred men were employed by the Messrs. Gage & Co. in that department, the cutting and housing requiring about two hundred more men.

The hoisting capacity of one chain is 6,000 tons per day. The elevator is designed for two chains which will be used when permanent houses are erected, the engine being of sufficient power to carry two. This will be at the rate of twenty-five tons per minute, through the working hours. No packing material is used in the body of the ice, but it is covered to the depth of eighteen inches with clean meadow hay. The men and teams employed are from the neighboring farms. This winter husbandry distributes large sums of money among the young farmers who have little for their hands or their teams to do at this season, even shoemaking—their old-time resource—having deserted the country, roadside shoe-shop for the crowded factory in town.

The Ice property now owned by Addison Gage & Co. at Wenham Lake was created in 1845 by Charles B. Lander of Salem who, with his brother, Genl. Frederick William Lander, and their associates, carried on the Ice business under the style of "The Wenham Lake Ice Co."

In 1846 the company made several shipments to London, Genl. Lander acting as its agent, and making quite a reputation for the Wenham Lake Ice.

The enterprise proved a failure, the property remaining idle from 1847 till December 1850 when it was purchased by Addison Gage, and his partners, Jacob Hittinger and Timothy T. Sawyer, who then formed the firm of Gage, Hittinger & Co.

From the date of its purchase until 1859 it was held

more as a reserve than as a source of regular supply, owing to the lack of proper terminal facilities for the loading of vessels.

In 1859 the Eastern Rail Road Company furnished good wharf accommodations at East Boston and up to 1867 the property was "worked" every year, excepting when the crop failed.

In 1866 some of the original houses were taken down and modern ones erected: at the same time, steam hoisting power was adopted in lieu of the old fashioned method of filling by horse power; the intention being not only to increase the storage capacity, but to make the crop more certain by housing the Ice by steam, three times as fast as it was possible to do by horse power. These improvements were hardly completed when the Eastern Rail Road Company raised the freight charge to such a point that the ice could not be shipped at a profit, with an ordinary market.

On the night of November 9, 1873, the first anniversary of the Boston fire, the houses, containing 35,000 tons of superior ice, housed the previous winter, together with the hoisting machinery, were totally destroyed by fire; without doubt incendiary.

The freight charge still being as established in 1866, no attempt was made to rebuild with any view to permanency. Late in 1876, however, the management of the Eastern Railroad, recognizing the importance of the Ice business, made such a proposition, as to induce the company again to utilize the property. A permanent elevator and temporary houses were at once erected and were ready for the crop of 1877 which proved to be a full one, as did those of 1879 and 1881. The crop of 1878 was less than one-half the average yield while that of 1880 was a total failure, a circumstance which seems to have

happened but once before in the history of the establishment.

The whole amount of Ice shipped from Wenham Lake, by the firms of Gage, Hittinger & Co. and Addison Gage & Co. from 1856—the records from 1851 to 1855 inclusive are missing,—to Jan'y 1882 is 353,450 tons, actual car weight, packed on board vessels at East Boston, to ship which it is necessary to cut and house at least 475,000 tons, the difference being the waste in meltage and breakage in handling; of amount the shipped, not over 70 per cent. on the average is landed at the ports of destination, principally the southern ports of the United States and the West India Islands, while not over 33 per cent. of the whole amount shipped is sold.

It is to be observed, therefore, that of the *ton* cut and housed, but a very small portion reaches the consumer.

The Wenham Lake Ice still maintains the high reputation which it immediately acquired on its introduction into the market, and to-day is advertised as sold in all the large cities of the United Kingdom, although not a ton of it has reached there excepting, perhaps, in the refrigerator of a Cunarder, for over thirty years.

In nearly all those cities there is a Wenham Lake Ice Company, but the ice which they sell is from Wenham Lake, Norway, not from the one we know so well and have enjoyed so much.

The ice at this time was 14 inches thick and several acres of surface were ready for storing, being cleared of the recent snow fall by a horse-power scraper,—grooved and ploughed by other machines similarly propelled and lifted into the store-houses by steam power on the elevator, a mechanism not unlike the endless apron. Manual labor is only applied at two points of the process. A little hand sawing is required in separating the cakes of ice,

and in their progress through the canals to the elevator. In their distribution in the packing houses, some guidance is required from men who stand by with stout boat-hooks in hand.

At noon the sleighs were refilled and the party driven to the Chebacco Ponds, leaving the opal ice-masses glittering in the snow behind them.

Arrived at Whipple's Hotel at Chebacco Ponds the company were soon seated at a comfortable dinner, after rising from which they met in the adjoining hall and were called to order by the President of the Institute, Dr. Wheatland, who opened the afternoon session at about 3 o'clock with some historical account of the locality, alluding to the old, unpainted, provincial farm-house, with lean-to roof and little window-glass, which the hotel had replaced, and to the Knowlton and Burchstead families, which had owned it. In his early scientific rambles he had often been led there by botanical research, and recalled the hospitality and kindliness with which, a half century ago, an old matron of the place cooked the pickerel he and his young associates used to catch in the pond and furnished from her dairy and cupboard the needful accessories of a midday meal.

He then introduced Mr. Robert S. Rantoul who said that, twenty years ago, he had occasion to inform himself very accurately and exactly about the nature of Wenham Pond water, for he was taking a position in advocacy of its introduction into Salem, which position was thought unbecoming by many excellent persons and severely criticised by some of his best friends; and it was necessary for him to be very sure indeed that he was making no mistake about its quality and abundance. He therefore collected and collated all the printed and scientific evidence he could find and then, by repeated visits and

inspections of the pond itself, gathered all he could learn by word of mouth, from life-long residents near it, and from the living evidence of his own senses.

Mr. Rantoul proceeded to read extracts from a mass of notes thus accumulated, most of which are to be found in print in Histor. Coll. Essex Institute, Vol. VI, pp. 82–3 and 141–52 and Vol. VIII, pp. 118–23, and commented on these extracts in the light of his recent European experience. He felt that if the people of Salem were more accustomed to leave home, they would appreciate more fully the blessings of Wenham Water, and he cited the evidence of its superior excellence and fame which he had collected from such authorities as Faraday, Dr. Charles T. Jackson, Sir Charles Lyell, Sir Francis Bond Head, Professor Chase of Brown University, the historians Alonzo Lewis of Lynn, and Dr. Allen of Wenham, and "Wilmer and Smith's European Times."

Rev. Geo. H. Hosmer, of the East Church, Salem, spoke of the interest with which these remarks had been listened to, and added that when a boy, living in another part of the country, he had taken part in an amateur performance of an English play called "The Serious Family" in which a feast was described, and among the delicacies enumerated was "Wenham Ice." This he had supposed to mean some English variety of ice cream unknown in this part of the world. He was amused on moving east, to find himself a neighbor of Wenham Lake and a consumer of its ice and water.

Mr. John H. Sears, of the Peabody Academy of Science, at Salem, then addressed the gathering, illustrating what he said about "Buds and the ramification of Branches" with a collection of twigs he had made from the neighboring forest trees. He said the time of the year was favorable for this investigation.

Branches are secondary stems developed from a primary one. When the leaves are opposite, as in the Maple, the branches will be opposite, and when they are alternate, as in the Beach, the branches will be alternate. In the axil of each leaf there are normally from one to three buds which are branches in a rudimentary form. In the Maple there are three, one directly in the axil of the leaf which is called the axillary bud, and one on each side called accessory buds. These do not all develop into branches: indeed if all the buds grew into branches there would be as many branches as leaves. In the normal condition the axillary and terminal buds are more fully developed, so that they are ready to commence growth as soon as the season permits, but if the terminal or axillary bud is destroyed, then the accessory buds take their place, so that this mode of development holds sufficiently to determine and exemplify the plan of ramification.

This plan of growth, which is carried out in the Maple, does not hold good in all other trees, as in the Lilac, for example, the terminal always fails and the lateral or accessory buds take its place, producing the forked form of branching.

A similar growth takes place in the Sassafras. Buds and branches can be observed in the winter season with more accuracy than at any other time, as the leaves are all off, giving an uninterrupted view of the whole tree. Every different species of tree has a form or symmetry peculiarly its own, and the nurseryman or botanist is as sure of a tree in the winter as in the summer, provided it is growing naturally or has been pruned by one who understands the natural symmetry of the tree. Certain causes, such as a prolonged season of warm weather, or an unusually severe frost in the early fall, work a marked change in the ramification of branches. In either case the frost kills

back the primary stem which has not become thoroughly ripened, thereby destroying the terminal bud: the result is that a two-forked growth takes place as the accessory buds take the place of the terminal. This is seen in the Red Maple in exposed situations on roadsides and on the borders of fields, but in the groves, where the different trees protect each other, this seldom happens. The principal reason why one cannot study the ramification of branches from shade trees in cities and towns is because, first, in transplanting, it is thought to be necessary to prune the stem and branches to make them correspond with the roots which have been mutilated by the spade in the process of removing. This pruning is often performed by persons who do not understand the natural laws which govern the ramification of the branches; the result is, a branch is removed here and there, without any regard to the natural symmetry of the tree.

Thus, as is the case with many of the shade trees growing in Salem and vicinity, the natural plan of the branches is destroyed. Shade trees need pruning but it should be performed by, or under the immediate direction of, some one who knows the natural laws which govern the symmetry of the tree to be pruned. For instance, a tree whose leaves are opposite should not be made to grow branches alternately on the primary stem; nor should we try to grow opposite branches on the stem of a tree whose leaves are alternate, for as soon as this is done the natural symmetry of the tree is lost. With the growers of fruit trees, pruning is often a science, indeed so much so that the nurseryman is always with his assistants to point out each limb that is to be removed, until the men become proficients in the business. But as a natural form of symmetry is not required in fruit trees; a man may be ever so expert in this business and not know how properly to

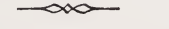
prune a forest tree so as to keep the original plan of the species. To any one who has given this subject a thought, to see the way in which shade trees in Salem are pruned, it would seem as if all that was required was to saw down as many branches as possible in the shortest possible time. The consequence of this is that, not only has the tree lost many of its fine branches, but its entire beauty, in so far as its natural symmetry is concerned, is lost. In order to understand the ramification of branches it is also necessary to know the plan of the growth of buds and the different species of trees. Buds are the germs of stems; leaf-buds are those devoted to vegetation. Mixed buds contain both foliage and flowers. Commonly, in plants that live from year to year, growth is divided into seasons or stages with intervals of repose. In such cases, especially in trees and shrubs, instead of a succession of foliage, the period of interruption is apt to be marked by the production of scales or rudimentary leaves which serve to protect the tender rudiments or growing points within, during the season of rest. This being the winter season in cold climates, Linnæus gave to such bud-coverings the name of *Hibernacula* and from the usual scale-like character of this covering they take the name of scaly buds. Large and strong ones of this kind, such as those of the Horse-chestnut, Magnolia and Hickory, may be taken as the type of this form of buds. In regard to the nature of bud-scales, that they answer to leaves is manifest from a consideration of their situation and arrangement, which are the same as that of the proper leaves of the species, and from the gradual transition from scales to leaves. In the unfolding buds of the Horse-chestnut every gradation may be traced between bud-scales and foliage.

Of the various kinds of buds it is needful to mention some, as there are shrubs and trees even in the coldest

climates whose buds are naked, that is to say, they are unprotected by special scales. Such are the *Viburnum nudum* or Whiterod, and the Hobblebush; the latest pair of leaves and also the flower cymes remain in a nascent state over winter without covering and expand into the first foliage in early spring. In other hardy shrubs and trees the buds are equally destitute of protecting scales, but they are usually minute and hidden in the bark or otherwise inconspicuous. Such examples may be seen in the *Robinia* (Locust) or the *Rhus* (Sumach). In the Plane tree or Buttonwood the buds are called subpetiolar, as they are formed under the base of the protecting leaf-stock, which forms a sheath or inverted cup fitted to and concealing the conical bud until autumn, when by the fall of the leaves the bud is exposed.

Again there are buds of an abnormal and irregular character, being produced without order and from any part of the stem and even from the roots. The latter, like the internodes of a stem, although normally destitute of buds, do produce them under certain conditions, as in the Willow and Popple, when wounded or pollarded. Even leaves may develop buds and then be used for propagation as in the *Bryophyllum*. Such buds are freely produced on the margins of the blade or its leaflets and are called adventitious buds.

At the close of the afternoon session the company returned to Salem.



SALEM, FEBRUARY 20, 1882.

A REGULAR meeting of the Society was held this evening; the PRESIDENT in the chair.

Mr. Austin D. Kilham of Beverly and Mr. C. C. Whittemore of Salem were duly elected members.

The President remarked that before proceeding to the regular communication of the evening it seemed highly appropriate that a tribute of respect be paid to the memory of a son of Salem, Rev. Samuel Johnson, who has long been known for his literary and philosophical writings, and whose brilliant career in the fields of study and research closed in death last evening at his residence in Andover.

The President called on Rev. E. B. Willson, who spoke of the life and services of Mr. Johnson, his eloquence in the pulpit, and the purity of his character and motives, relating incidents of his early life and ministry, and the impression his serious earnestness made upon those with whom he came in contact. He referred to the value of his work on Oriental Religions, and the very faithful labor expended upon its preparation, the volumes appearing at wide intervals of time, and only after the most conscientious and exhaustive preparation. Mr. Willson expressed regret that the work was left unfinished, and concluded by relating the following incident of Mr. Johnson's ministry, illustrative of the high appreciation of his character by the Rev. Dr. Flint. Dr. Flint, it seems, from time to time, asked Mr. Johnson to preach in his pulpit. The preaching never failed to call forth remonstrances from some of the doctor's parishioners against his inviting one of such unconventional sentiments to speak in his place. In each instance Dr. Flint would answer the complainant with some kind and appreciative words for the offending young man, and express full confidence that he would outgrow his erroneous views. The parishioner, thinking that his counsel had taken effect and that his pastor had been sufficiently warned against a repetition of his indiscretion, would be surprised to find afterwards by another appearance of Mr. Johnson in the East Church pulpit,

how great was the good doctor's regard for him, and his confidence that he would "come out all right."

Mr. William P. Andrews then spoke of Mr. Johnson's great moral earnestness, and his devotion to the loftiest ideals. He had been called an iconoclast, and while it was true that he was an image breaker, and did not always allow for the reverential feeling of his hearers for the cherished forms and creeds, he never attacked them wilfully, nor from other than the noblest motives. When he did so, it was in the lofty spirit of the Puritan: he strove to destroy the idol, that the God behind and above all outward forms might stand revealed. Mr. Johnson was, Mr. Andrews said, a Puritan in the best sense of the word, pure, high-minded, and devoted to every noble cause. He alluded to the very high estimate placed on the value of his volumes on Oriental Religions by persons most conversant with the subject in England and the East, and to the published recognition of his services in this direction. He then spoke of the warm sympathy and kindly aid and encouragement extended by Mr. Johnson to younger men, and in conclusion offered the following *Resolutions* which were seconded by Rev. Mr. Willson, and being submitted to the meeting by the President, were unanimously adopted:—

*Resolved*, That in the death of Rev. Samuel Johnson of North Andover, the community has lost an accomplished scholar, a singularly conscientious clergyman and noble friend.

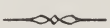
*Resolved*, That this Society acknowledges with just pride Mr. Johnson's contributions to literature, and to the

science of comparative theology; and desires to express its profound regret that his faithful labors have been so sadly interrupted.

*Resolved*, That recognizing his eloquence as a preacher and writer, this Society further desires to record its appreciation of Mr. Johnson's exalted character, and the exceptional purity of motive which marked him in every relation of life:

*Resolved*, That these Resolutions be spread upon the records of the Essex Institute, and that the Secretary be instructed to transmit a copy of the same to the members of Mr. Johnson's family.

Rev. C. F. Rice, of Salem, then presented, in an informal manner, an interesting sketch of his trip to England and the Continent, during the past summer.



Regular Meeting, Monday, March 20, 1882.

Meeting this evening. The President in the chair. Records read. Correspondence and donations announced.

E. P. Robinson, esq., of Saugus, occupied the hour of the meeting with a graphic and stirring paper on "What I know about Whaling." The results of his experience and observations, when a young man, during a

whaling voyage from New Bedford, of some two years duration, were vigorously presented.

## Regular Meeting, Monday, April 3, 1882.

Meeting this evening. President in the chair. Records read.

Prof. G. F. Wright, of Oberlin, Ohio, gave an account of the discoveries made in Pennsylvania last summer by him and Prof. H. C. Lewis concerning the southern limits of ice-action (otherwise called the terminal moraine) during the glacial age. These investigations were made under the direction of Prof. Lesley, who has charge of the elaborate geological survey now in progress in that state.

Previously to last summer, Clarence King had first, in 1876, through a paper of Mr. Wright's before the Boston Society of Natural History (see Proceedings, Vol. XIX, pp. 60–63),called attention to the terminal moraine at Wood's Hole. Subsequently, Warren Upham, taking up the clew, had followed it through Cape Cod and Long Island, where the line joined on to that discovered by Prof. Cook of New Jersey, reaching the sea at Perth Amboy just below New York, and crossing the Delaware river at Belvidere, a little above Easton, Pennsylvania. From this point the line of the terminal moraine was seen laid down upon a map fifteen by ten feet, displayed for the first time to a scientific society, crossing Northampton county by a general northwestern course to the centre of Monroe county; thence westward crossing the Lehigh fifteen miles above Mauch Chunk, and the Susquehanna twenty miles below Wilkesbarre; thence by

a northwesterly course through Columbia county, rising to the summit of the Alleghanies in Lycoming county, and crossing them diagonally through Tioga and Potter counties, where the general elevation of the country is upwards of 2,000 feet. From Potter county the moraine enters Cattaraugus county, N. Y., and continues to trend northward as far as Little Valley, six miles north of Salamanca, where it makes a sharp turn to the southwest, running nearly parallel with the Alleghany river to Columbiana county, Ohio. The whole length of the line explored this last summer is about four hundred miles. The signs of glacial action abruptly cease along this line, and it is marked by a special accumulation of unstratified material composed of clay, scratched stones, and granite boulders. North of that line the signs of glaciation are everywhere apparent. South of it there are no scratched stones, no transported boulders, and no "till," or boulder clay. Where streams cut through the line, however, boulders of granite and quartzite have been transported by water and deposited in terraces and deltas. The gravel of Trenton, N. J., in which Dr. C. C. Abbott has found palæolithic implements is in a delta terrace thus formed when the river was fifty feet higher than now. Every stream to the westward, which rises in the glaciated region and flows through the unglaciated region, has formed corresponding terraces and deltas, and is full of interest. Thorough search for palæolithic implements should be made in all such formations.

The majestic proportions of the great ice movement are seen in the fact that it advanced as far south upon the mountains as in the valleys. For example, the valley between the Kittatinny and Pocono mountains, though twenty miles wide and one thousand feet deep, caused

but a slight deflection of the ice-front to the south. The same is true where the moraine crosses the valley of the east branch of the Susquehanna. The grand deflection of the line to the northward is evidently due to variations in the forces which were pushing from behind.

Now that an accurate knowledge of the southern limits of the continental glacier is being obtained, it will be possible to get a variety of approximate estimates of the quantity of erosion which has taken place since the great ice age, and so a more correct idea of its antiquity. A full account of this subject will appear in the Report of the Pennsylvania Geological Survey. Arrangements are in progress for Mr. Wright to continue the exploration through Ohio during the coming summer of 1882.

The remarks of Professor Wright, illustrated by reference to the great, original map above alluded to, were heard by an appreciative gathering, who also examined with interest, a dozen or more specimens of the "scratched stones," showing glacial action, as well as some of the palæolithic implements exhibited by the speaker. At the close of his address a discussion arose between the Rev. R. Randall Hoes, of Lambertville, near Trenton, N. J. (who happened to be in town, engaged in some genealogical research, and knew the locality well, having a large collection illustrating the mineralogy and ethnology of the region on his own shelves), John H. Sears of the Peabody Academy of Science, Prof. I. J. Osbun of the State Normal School, and Professor Wright, in which some difference of opinion was developed as to the power of running streams to cut their way down through obstructions of stone or gravel, and as to the rate of cutting.

Regular Meeting, Monday, May 1, 1882.

Meeting this evening at 7.30 o'clock. The President in the chair. The records of the last meeting read. Donations and correspondence announced.

The letters from Mr. George E. Davenport, Corr. Sec'y of the Middlesex Institute, tendering an invitation to unite in a joint Field Meeting to be held at the Middlesex Fells, and suggesting June 17 as the day of Meeting, and from the Boxford Natural History Society, accepting an invitation from the Institute to visit Salem, were referred to the Field Meeting committee.

The President referred to the previous meeting held by the Institute in commemoration of this day, tracing back the origin of its observance to remote antiquity and alluding briefly to the views of the early settlers respecting the festivities of its occurrence, to whom they were extremely distasteful; soon after the landing of the Pilgrims at Plymouth, events occurred in their neighborhood which called forth an official denunciation by the colonial authorities; the celebration at Ma-re-mount, now Mount Wollaston, Quincy, under the direction of Thomas Morton of Clifford's Inn in 1626 was cited as a familiar illustration. Times have changed, and May day morning is frequently observed to welcome the sun's return, the bursting of the buds and the birth of the flowers.

Mr. John H. Sears read an interesting paper giving the date of the appearance of several of our spring flowers; also a list of those that have been noticed in bloom the present season. The following is an abstract:—

During a series of years, now nearly twenty, in which I have taken notes on the time of blossoming of the early spring flowers, I have come to the conclusion that April is the earliest season in which we can say that the spring flowers are in blossom. This, of course, is the time when any one, who is conversant with their habit and has a knowledge of localities, may find them. Any earlier time of flowering is due to a series of peculiar circumstances. Sometimes early seedlings blossom in October and November; I have found the Hepatica and the Thalictrum every month in the year except September. In 1869 the Hepatica was in blossom in December, in January 1870, and though we had a snowstorm the 2nd of February, I collected some on the 4th from under the snow. March 4th to 10th I have got some Hepaticas in flower every year since, and not in the same place more than two seasons in succession. If an early snow remains on the ground through November, December and January, in a locality called Oakes' Ledge in Danvers, the frost will have come out sufficiently for them to blossom on the last of February or first of March, or shortly after the Line Gale which usually occurs at about this time, as the snow is usually carried away by it. Again, at Mile Brook, another locality in Danvers, unless we have a snowstorm from the southeast in the latter part of February, we are almost sure to find Hepaticas in early March. This spot is a rocky ravine facing the southeast. Something similar might be said of several other localities in this vicinity. Again the *Symplocarpus fœtidus* (Skunk Cabbage) may be found on the borders of Leach's Swamp, in a series of large spring holes, at any time after January. I have collected it for analysis for the last ten years each succeeding February or early March. Save

in this locality April is early for it. The *Draba verna* (Whitlow Grass) I have found in the last of February and first of March, in Peabody, for twelve years or more, but in a locality in Danvers facing the southeast, a very early spot, it is not in flower till the last of April or first of May, so that in my estimation it is not so much due to the direct influence of the season as it is to some peculiar circumstances by which the plant is surrounded.

The whole number of plants that have been and are in blossom in the fields up to this date is thirty-nine. They are the *Hepatica triloba*, *Draba verna* and *Draba Caroliniana*, *Houstonia cœrulea*, *Thalictrum anemonoides*, *Anemone nemorosa*, *Saxifraga Virginiensis*, *Aquilegia Canadensis*, *Taraxacum Dens-leonis*, *Erythronium Americanum* (Adder's tongue), *Viola odorata* (European, introduced), *Viola lanceolata*, *Viola sagittata*, *Sanguinaria Canadensis* (Blood-root), *Caltha palustris* (Marsh Marigold), *Ranunculus abortivus* (Small flowered Crowfoot), *Acer dasycarpum* (White Maple), *Acer rubrum* (Red Maple), *Ulmus Americana* (Elm), *Corylus Americana* and *Corylus rostrata* (Hazel), *Alnus incana* (Alder), *Lindera Benzoin* (Benjamin-bush), *Salix discolor*, *Salix cordata*, *Salix sericea*, *Salix purpurea*, *Salix humilis*, *Populus tremuloides*, *Comptonia asplenifolia* (Sweet-Fern), *Myrica Gale*, *Amelanchier Canadensis* (Shadbush), *Stellaria media* (Chickweed), *Capsella Bursa-pastoris* (Shepherd's Purse), *Juniperus Virginiana* (Red Cedar), *Taxus baccata* (Yew), *Carex Pennsylvanica* (a Sedge), *Equisetum arvense*, *Potentilla Canadensis*, *Epigœa repens*, *Cassandra*, *calyculata*.

To these may be added twelve hardy Cultivated plants which have blossomed in the open air, making fifty-one

kinds and *Dirca palustris*, *Callitriche verna*, *Populus balsamifera candicans*, or fifty-four kinds in all.

A discussion on the topics alluded to in the above paper followed, participated in by the President, Messrs. Richard C. Manning, John H. Sears and others.

Adjourned.

ANNUAL MEETING, MONDAY, MAY 15, 1882.

THE annual meeting this evening at 7.30 o'clock. The PRESIDENT in the chair. Records of the last annual meeting read.

The reports of the Secretary, Treasurer, Auditor, Librarian, and the Curators and Committees were read and duly accepted, and ordered to be placed upon file.

Mr. T. F. HUNT, chairman of the committee on nominations, reported the following list of officers, who were duly elected; Messrs. Hunt and Israel having been requested to collect, assort, and count the votes.

PRESIDENT:

HENRY WHEATLAND.

VICE-PRESIDENTS:

ABNER C. GOODELL, JR. — DANIEL B. HAGAR.
FREDERICK W. PUTNAM. — ROBERT S. RANTOUL.

SECRETARY:

GEORGE M. WHIPPLE.

TREASURER:

GEORGE D. PHIPPEN.

AUDITOR:

RICHARD C. MANNING.

LIBRARIAN:

WILLIAM P. UPHAM.

CURATORS:

*History*—HENRY F. WATERS.
*Manuscripts*—WILLIAM P. UPHAM.
*Archæology*—FREDERICK W. PUTNAM.
*Numismatics*—MATTHEW A. STICKNEY.
*Geology*—ISAAC J. OSBUN.
*Botany*—GEORGE D. PHIPPEN.
*Zoölogy*—EDWARD S. MORSE.
*Horticulture*—JOHN E. PEABODY.
*Music*—JOSHUA PHIPPEN, JR.
*Painting & Sculpture*—T. F. HUNT.
*Technology*—EDWIN C. BOLLES.

COMMITTEES:

*Finance:*

The PRESIDENT, *Chairman ex off.*
JAS. O. SAFFORD. — HENRY M. BROOKS. — GEO. R. EMMERTON.
The TREASURER, *ex off.*

*Library:*

CHARLES W. PALFRAY. — GEORGE F. FLINT. — HENRY F. KING.
WILLIAM NEILSON. — WILLIAM D. NORTHEND.
The LIBRARIAN, *ex off.*

*Publication:*

EDWARD S. ATWOOD. — ABNER C. GOODELL, JR. — EDWIN C. BOLLES.
H. F. WATERS. — T. F. HUNT.
JAMES A. EMMERTON.

*Lecture:*

ROBERT S. RANTOUL. — FREDERICK W. PUTNAM. — AMOS H. JOHNSON.
FIELDER ISRAEL. — ARTHUR L. HUNTINGTON.

*Field Meeting:*

The SECRETARY, *Chairman ex off.*

GEORGE A. PERKINS, Salem
GEORGE COGSWELL, Bradford.
FRANCIS H. APPLETON, Peabody.
NATHANIEL A. HORTON, Salem.
EDWARD S. MORSE, Salem.
GEORGE D. PHIPPEN, Salem.
FRANK R. KIMBALL, Salem.
EBEN N. WALTON, Salem.
WINFIELD S. NEVINS, Salem.
JOHN H. SEARS, Salem.

THE RETROSPECT OF THE YEAR

compiled from the several reports read at the meeting, and the remarks of several members in relation thereto, presents the work of the Institute in the various departments since the last annual meeting.

MEMBERS.—Changes occur in the list of our associates by the addition of new names and the withdrawal of some by resignation, removal from the county or vicinity, or by death.

We have received information of the decease of twelve resident members, during the year.

JOHN V. STEVENS, born in Peabody, Nov. 22, 1807, tanner and currier; died at Peabody, June 19, 1881. Elected a member May 6, 1867.

NATHANIEL SILSBEE, son of Nathaniel and Mary (Crowninshield) Silsbee, born in Salem, Dec. 28, 1804; graduated at Harvard College, 1824, merchant; mayor of Salem 1849, 1850, 1858 and 1859; died at Milton, July 9, 1881. An original member.

ELIJAH W. UPTON, son of Elijah and Phebe (Wood) Upton, born in Danvers, now Peabody, Feb. 24, 1811, a glue manufacturer; died in Peabody, Oct. 5, 1881. Elected a member June 26, 1850.

BENJAMIN FABENS, son of Benjamin and Hannah (Stone) Fabens, born in Salem, May 28, 1809, merchant; died at Salem, Dec. 8, 1881. Elected a member March 30, 1859.

FRANCIS CHOATE, son of John and Susanna (Choate) Choate, born in Essex, Dec. 30, 1798, a trader; died at Salem, Jan'y 20, 1882. Elected a member July 6, 1864.

John Pickering, son of John and Sarah (White) Pickering, born in Salem, Nov. 8, 1808; graduated at Harvard College, 1830, a broker in Boston; died at Salem, Jan'y 20, 1882. Elected a member May 3, 1848.

Thomas H. Frothingham, son of Daniel and Hannah (Frothingham) Hoppin, born in Salem, Oct. 20, 1823, a stove dealer; died at Salem, March 5, 1882. He assumed the maiden name of his mother. Elected a member April 24, 1857.

John Bertram, son of John and Mary (Perchard) Bertram, born in the Isle of Jersey, Feb. 11, 1796, merchant; died at Salem, March 22, 1882.

Milton P. Braman, son of Isaac and Hannah (Palmer) Braman, born in Rowley, now Georgetown, Aug. 6, 1799; graduated at Harvard College 1819; minister of the First Church in Danvers from April 12, 1826 to Sept. 2, 1863; died at Auburndale, April 10, 1882. An original member.

William Sutton, son of William and Nancy (Osborne) Sutton, born in Salem, July 26, 1800, manufacturer; died at Peabody, April 18, 1882. Elected a member March 29, 1848.

Daniel C. Manning, son of Richard and Abby (Lane) Manning, born in Ipswich Dec. 27, 1805, stabler in Salem; died at Winchendon, N. H., April 30, 1882. Elected a member April 5, 1875.

David Nichols, son of Stephen and Abigail (Moulton) Nichols, born at Salem, Aug. 22, 1809, tanner; died at Salem, May 1, 1882. Elected a member Nov. 21, 1876.

Field Meetings.—These have been perhaps of more than usual interest, several papers of marked quality having been presented and read. During the year six were held as follows: *First*, at Rowley (an old and interesting

town incorporated in 1639) on Tuesday, July 7, 1881. The forenoon was devoted to a ramble in the woods under the guidance of John H. Sears. At the afternoon session in the Town Hall, Mr. Sears exhibited the plants collected during the day, with appropriate and instructive remarks. Miss Mary N. Plumer of the State Normal School, Salem, read a very interesting and able paper on "The Dissemination of Seeds." Rev. John Pike, of Rowley, Rev. G. M. Harmon, of Peabody, Rev. Charles C. Bruce, of Rowley, and Hon. N. A. Horton, of Salem, followed, pleasantly alluding to several topics suggested by the place and the occasion.

*Second meeting.*—At Marblehead Neck, Wednesday, August 3, 1881. Mr. John H. Sears, of Salem, Hon. J. J. H. Gregory, of Marblehead, Prof. E. S. Morse, and Hon. W. D. Northend, both of Salem, took part in the exercises of the afternoon session.

*Third meeting.*—At Saugus, Wednesday, August 30, 1881. Mr. John H. Sears exhibited and described several specimens of plants collected during the forenoon ramble. Prof. H. B. Adams read a paper on "The Commons and Commoners of Salem." Dr. J. W. Goodell, of Lynn, and Mr. E. P. Robinson, of Saugus, presented communications of historic interest.

*Fourth meeting.*—At Boxford, Saturday, Oct. 8, 1881. At the afternoon session, Rev. William P. Alcott, of Boxford, presented a collection of introduced plants found in the vicinity of a wool-scouring establishment, and has since prepared a valuable communication on the same, which is printed in the Bulletin. Mr. John Robinson and others took part in the exercises.

*Fifth meeting.*—At Chelsea, Friday, October 14, 1881. The party after visiting the "Art Tile Works" of the

Messrs. Low, and the works of the "McGee Furnace Company," assembled in the rooms of the Chelsea Review Club, where brief remarks were offered by Mr. J. G. Low, who gave an account of the tile factory, how it was commenced, and its progress to the present time; by Prof. E. S. Morse, who spoke of the pottery of the Japanese; and by Vice Pres. F. W. Putnam, on the pottery of the several Indian tribes of America.

*Sixth meeting.*—At Whipple's, near the shores of the Chebacco pond, on Saturday, Feb. 11, 1882, stopping at Wenham pond to see the process of cutting and storing ice. At the afternoon session Mr. R. S. Rantoul gave an historical sketch of Wenham Pond, alluding to the introduction and extent of the ice-cutting operations conducted by the Messrs. Gage & Hittenger. Remarks were also made by the chair, Mr. John H. Sears, the Rev. George H. Hosmer and others.

Excursions.—*First*, to Cambridge, on Wednesday, May 25, 1881, by the polite invitation of President Eliot, Mr. F. W. Putnam and other officers, having in charge the various libraries, museums, etc. The Peabody Museum of American Archæology and Ethnology, Museum of Comparative Zoölogy, Gymnasium, Memorial Hall, Sever Hall, Library in Gore Hall, Chemical Laboratories, the mineralogical collection in Boylston Hall, the Botanic Garden and Herbarium, and the Observatory were visited.

*Second.*—To New York city, Manhattan Beach, West Point, and the Catskill Mountains; leaving Salem on Wednesday, July 13, 1881, and returning on Thursday, July 21.

*The third.*—To Mt. Desert, leaving Salem on Tuesday, Sept. 13, returning on Friday, Sept. 16, 1881.

LECTURES.—A course of seven lectures, under the direction of the lecture committee, have been delivered as follows: *First*, J. E. Russell, "An Inter-oceanic Canal," Monday, Oct. 18, 1881. *Second*, Prof. T. C. Mendenhall, "Earthquakes," Friday, Nov. 25, 1881. *Third*, Rev. James Freeman Clarke, "English Literature," Monday, Dec. 5, 1881. *Fourth*, Rev. E. G. Porter, "Arms and Armor," Monday, Jan'y 9, 1882. *Fifth*, E. H. Elwell, "Conversation," Monday, Jan'y 30, 1882. *Sixth*, Dr. B. Joy Jeffries, "Color Blindness," Monday, Feb'y 27, 1882. *Seventh*, Prof. E. S. Morse, "Japan," Monday, March 27, 1882.

In addition to the above a course of four free lectures was given by George M. Towle, of Boston, upon famous men of our day: I. Wednesday, Nov. 9, 1881, "Bismarck." II. Wednesday, Nov. 16, "Gladstone." III. Wednesday, Nov. 23, "Beaconsfield." IV. Wednesday, Nov. 30, "Gambetta." These lectures were delivered in the afternoon at four o'clock.

Subsequently, three lectures were given by the same gentleman, the subjects being "Victor Hugo," "Victoria," and "The Nihilist," on the afternoons of Wednesdays Feb'y 1, 8, and 15, 1882.

Three lectures on art were delivered by S. R. Kœhler, Esq., of Boston, during the afternoons of Wednesdays, March 1, 8, and 15, 1882. The first was on "The future of Art in America;" the remaining two on "Color Printing."

CONCERTS.—Under the personal direction of the curator of Music, four concerts in the regular, and three in a supplementary course have been given with great acceptance. This was the thirteenth concert season of the Institute: *First*, on Monday evening, Dec. 12, 1881, by

Miss H. A. Brooks, Mrs. George Henschel, and Mr. J. Phippen, jr. *Second*, Monday evening, Dec. 26, 1881, by Miss Sarah C. Fisher, Messrs. A. W. Foote, Charles N. Allen, and Wulf Fries. *Third*, Monday evening, Jan'y 23, 1882, by Mrs. M. E. Gibson, soprano; Mrs. W. H. Wadleigh, alto; Mr. C. J. Parker, tenor; Mr. W. H. Wadleigh, tenor; Dr. E. C. Bullard, bass, and Mr. H. M. Aiken, bass. *Fourth*, Monday evening, Feb. 6, 1882, by Miss Sara Barton, soprano; Miss Sophie Rohe, pianoforte; Mr. Bernhard Listemann, first violin; Mr. Fritz Listemann, second violin; Mr. Carl Meisel, viola; Mr. Alexexander Heindl, violoncello. *Supplementary, first.*—Friday evening, April 21, 1882, by Harvard Glee Club. *Second*, Tuesday afternoon, April 25, 1882, by Mr. J. Phippen, jr., with the assistance of Miss Annabelle Clark, of Boston, soprano, and Mr. W. J. Lefavour, violinist. *Third.*—Tuesday afternoon, May 2, 1882, by Miss Clara L. Emilio, assisted by Mrs. Anna S. Brown, Mr. Wm. S. Fenollosa, and Mr. Jean M. Missud.

Meetings. Regular meetings occur on the first and third Monday evenings of each month. At these the following communications were received and lectures delivered: From *John H. Sears*, "Notes on the Forest Trees of Northern New York;" *Rev. C. F. Rice*, "A familiar talk on his recent trip to Europe;" *Rev. George F. Wright*, "On the Terminal Moraines of Pennsylvania;" *John J. Latting*, of New York, "List of Marriages by Rev. Daniel Hopkins, of Salem, 1778 to 1814;" *F. M. Ray*, of Portland, "The journal of Dr. Caleb Rea written during the expedition against Ticonderoga in 1758;" *Eben Parsons*, "Sketch of the First Church in Lynnfield;" *Wellington Poole*, of Wenham, "Abstracts of Wenham Records;" *E. P. Robinson*, of Saugus,

"What I know about Whaling;" *Henry F. Waters*, "An account of the Newhall Family," etc., etc.

A Social Meeting of the members and their families was held on the evening of Jan'y 6; Prof. E. S. Morse gave an illustrated talk on Japan; and at a later hour refreshments were served.

Publications have been issued as heretofore,—the Bulletin, vol. xiii, and the Historical Collections, vol. xviii. The exchange list, with few exceptions, continues the same as last year.

Library.—The additions to the Library for the year (May, 1881 to May, 1882) have been as follows.

*By Donation.*

| | |
|---|---|
| Folios, | 25 |
| Quartos, | 117 |
| Octavos, | 663 |
| Duodecimos, | 474 |
| Sexdecimos, | 133 |
| Octodecimos, | 6 |
| Total of bound volumes, | 1418 |
| Pamphlets and serials, | 7560 |
| Total of donations, | 8978 |

*By Exchange.*

| | |
|---|---|
| Quartos, | 5 |
| Octavos, | 68 |
| Duodecimos, | 5 |
| Total of bound volumes, | 78 |
| Pamphlets and serials, | 1678 |
| Total of exchanges. | 1756 |
| Total of donations, | 8978 |
| Total of exchanges, | 1756 |
| Total of additions, | 10,734 |

Of the total number of pamphlets and serials, 3,361 were pamphlets, and 5,877 were serials.

The donations to the Library for the year have been received from one hundred and eighty-two individuals

and fifty departments of the General and State governments and societies, eleven of which are foreign. The exchanges from one hundred and fifty-five societies and incorporate institutions of which one hundred and one are foreign; also from editors and publishers.

The annual examination of the Library has been made. Of the twelve volumes that were missing last year, ten have been returned; seven others are now missing from their places.

Donations or exchanges have been received from the following:—

| | Vols. | Pam. |
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| Adams, Herbert B., Baltimore, Md., | | 1 |
| Adelaide, R. Society of So. Australia, | 1 | |
| Almy, James F., | 2 | |
| Alnwick, Eng., Berwickshire Naturalists' Club, | 1 | |
| American Association for the Advancement of Science, | 2 | |
| Amiens, Société Linnéenne du Nord de la France, | | 20 |
| Amsterdam, K. Z. Genootschap "Natura Artis Magistra," | 1 | |
| Anagnos, M., So. Boston, | | 1 |
| Andrews, Mrs. James H., | | 1 |
| Andrews, William P., | | 50 |
| Anthony, Mrs. John G., Cambridgeport, | 25 | 32 |
| Appleton, William S., | | 2 |
| Archæological Institute of America, | | 1 |
| Archer, Miss Rebecca, Newspapers, | | |
| Augsburg, Naturhistorischer Verein, | | 1 |
| Baltimore, Md., Maryland Historical Society, | | 1 |
| Baltimore, Md., Johns Hopkins University, | | 1 |
| Baltimore, Md., Peabody Institute, | | 1 |
| Bancroft, C. F. P., Andover, | | 1 |
| Barstow, Benjamin, | 1 | 1 |
| Bartlett, J. W., Marblehead, | | 1 |
| Batavia, K. Naturkundige Vereeniging in Nederlandsch Indie, | | 1 |
| Baton Rouge, La., State University, | | 1 |
| Bemis, Luke, West Chester, Pa., | | 2 |
| Berlin, Gesellschaft Naturforschender Freunde, | | 1 |
| Berlin, Verein zur Beförderung des Gartenbaues, | | 12 |
| Berlin, Zeitschrift für die Gesammten Wissenschaften, | 1 | |
| Bern, Naturforschende Gesellschaft, | 1 | |

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| Bolles, Rev. E. C., | 52 | 200 |
| Bologna, Accademia delle Scienze, | | 1 |
| Bonn, Naturhistorischer Verein der Preussischen Rheinlande u. Westfalens, | 1 | 3 |
| Bordeaux, Académie Nationale des Sciences, Belles-Lettres et Arts, | 1 | |
| Boston, American Academy of Arts and Sciences, | 1 | 1 |
| Boston, Appalachian Mountain Club, | | 1 |
| Boston, Athenæum Library, | | 1 |
| Boston, Board of Health, | | 2 |
| Boston, City of, | 6 | |
| Boston, Massachusetts Historical Society, | 2 | |
| Boston, Massachusetts Horticultural Society, | | 4 |
| Boston, Massachusetts Institute of Technology, | | 1 |
| Boston, Massachusetts Medical Society, | 1 | 1 |
| Boston, Massachusetts State Board of Health, Lunacy and Charity, | 2 | |
| Boston, Massachusetts State Library, | | 1 |
| Boston, National Association of Wool Manufacturers, | 1 | 3 |
| Boston, New England Historic Genealogical Society, | | 5 |
| Boston, Public Library, | | 5 |
| Boston, Scientific Society, | | 4 |
| Boston, Society of Natural History, | | 16 |
| Boston, Zoölogical Society, | | 1 |
| Bradlee, Rev. C. D., Boston, | | 1 |
| Braunschweig, Archiv für Anthropologie, | | 2 |
| Braunschweig, Verein für Naturwissenschaft, | | 1 |
| Bremen, Naturwissenschaftlicher Verein, | | 3 |
| Briggs, Miss M. E., | 2 | |
| Brinley, Francis, Newport, R. I., | | 1 |
| Brock, R. A., Richmond, Va., Newspapers, | | |
| Brooklyn, N. Y., Church of the Saviour, | 1 | |
| Brooklyn, N. Y., Collegiate and Polytechnic Institute, | | 2 |
| Brooklyn, N. Y., Long Island Historical Society, | | 1 |
| Brooks, Rev. Charles T., | | 1 |
| Brooks, Henry M., | 3 | 13 |
| Brooks, Mrs. Henry M., Newspapers, | | 23 |
| Brown, Henry A., | 1 | 1 |
| Brown, John Coffin Jones, Boston, | | 1 |
| Brown, S. J., Salisbury, | | 1 |
| Browne, Miss Frances, | 60 | |
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| Bruxelles, L'Académie R. de Belgique, | 6 | 6 |

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| Bruxelles, Société Belge de Microscopie, | | 8 |
| Bruxelles, Société Entomologique de Belgique, | | 5 |
| Bruxelles, Société R. Malacologique de Belgique, | 2 | 9 |
| Bryant, James S., Hartford, Conn., | 5 | |
| Buenos Aires, Sociedad Cientifica Argentina, | | 8 |
| Buffalo, N. Y., Society of Natural Sciences, | | 2 |
| Burnham, John H., Bloomington, Ill., | | 1 |
| Bützow, Verein der Freunde der Naturgeschichte in Mecklenburg, | 1 | |
| Caen, Académie Nationale des Sciences, Arts et Belles-Lettres, | 2 | |
| Calcutta, Geological Survey of India, | 3 | 25 |
| Caller, James M., | 1 | |
| Calley, Samuel, | 1 | 1 |
| Cambridge, Library of Harvard University, | | 6 |
| Cambridge, Museum of Comparative Zoölogy, | 2 | 2 |
| Cambridge, Nuttall Ornithological Club, | | 4 |
| Cambridge, Peabody Museum of American Archæology and Ethnology, | | 2 |
| Carpenter, Rev. C. C., Mount Vernon, N. H., | | 1 |
| Case, Theodore S., Kansas City, Mo., | | 1 |
| Cassel, Verein für Naturkunde, | | 1 |
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| Cherbourg, Société Nationale des Sciences Naturelles, | | 1 |
| Chicago, Ill., Historical Society, | 1 | |
| Chicago, Ill., Public Library, | | 1 |
| Choate, George F., | 10 | |
| Choate, Joseph H., New York, N. Y., | | 1 |
| Cincinnati, O., Board of Education, | 1 | |
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| Curwen, George R., | | 10 |
| Curwen, James B., | | 28 |
| Cutter, Abram E., Charlestown, | | 1 |
| Danzig, Naturforschende Gesellschaft, | 1 | |
| Darmstadt, Verein für Erdkunde, | 1 | |
| Dean, John W., Boston, | | 12 |
| De Borre, Alf Preudhomme, Bruxelles, | | 1 |
| Dexter, George, Boston, | | 1 |
| Doolittle, Miss E., Troy, N. Y., | | 1 |
| Dresden, Naturwissenschaftliche Gesellschaft, "Isis," | | 1 |
| Dublin, Royal Irish Academy, | | 8 |
| Dublin, Royal Society, | | 7 |
| Eastman, S. C., Concord, N. H., | | 1 |
| Eddy, Miss Harriet, | 1 | |
| Edinburgh, Royal Society, | 1 | |
| Ellery, Harrison, Boston, Chart of the Ellery Family, | | |
| Elwell, E. H., Portland, Me., | | 2 |
| Emerson, Mrs. Jasper, | | 1 |
| Emmerton, James A., | 1 | 19 |
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| Felton, Cyrus, Marlborough, | | 1 |
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| Frankfurt, a. m., Neue Zoologische Gesellschaft, | | 12 |
| Frankfurt, a. m., Senckenbergische Naturforschende Gesellschaft, | 2 | |
| Frankfurt, a. m., Verwaltung des Medicinalwesens, | | 1 |
| Genève, L'Institut National Genevois, | 1 | |
| Genève, Société de Physique et d'Histoire Naturelle, | | 1 |
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| Giessen, Oberhessische Gesellschaft für Natur u. Heilkunde, | | 1 |
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| Görlitz, Naturforschende Gesellschaft, . . . . . | 1 | |
| Göttingen, K. Gesellschaft der Wissenschaften, . . | 1 | |
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| Hamburg-Altona, Naturwissenschaftlicher Verein, . | | 1 |
| Hannover, Naturhistorische Gesellschaft, . . . | | 1 |
| Harlan, Caleb, Wilmington, Del., . . . . . | 1 | |
| Harlem, Société Hollandaise des Sciences, . . . | | 5 |
| Hart, Charles Henry, Philadelphia, Pa., . . . . | | 3 |
| Hartford, Conn., Trinity College, . . . . . | | 1 |
| Hassam, John T., Boston, . . . . . | 1 | 1 |
| Hazen, William B., Washington, D. C., . . . . | 1 | 2 |
| Hervey, Rev. A. B., Taunton, . . . . . | 1 | |
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| Luxembourg, Institut R. Grand Ducal, | 1 | |
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| Lyon, Académie des Sciences, Belles-Lettres et Arts, | 1 | |
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| Mexico, Museo Nacional, | | 3 |
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| Milwaukee, Wisconsin Natural History Society, | | 1 |
| Montreal, Geological Survey of Canada, Maps, | 1 | 1 |
| Morison, George S., New York, N. Y., | 1 | |
| Morrissey, D. H., Boston, | 1 | |
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| Moulton, Joshua W., | | 1 |
| München, K. B. Akademie der Wissenschaften, | | 25 |
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| Neuchâtel, Société des Sciences Naturelles, | 1 | 1 |
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| New York, Genealogical and Biographical Society, | | 4 |
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| Norwegian North Atlantic Expedition, Editorial Committee of, | | 3 |
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| Philadelphia, Numismatic and Antiquarian Society, | | 1 |
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| Stickney, George A. D., | | 9 |
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| Stone, Eben F., Washington, | 2 | 60 |
| Stone, Robert, Newspapers, | | |
| St. Pétersbourg, Académie Impériale des Sciences, | | 26 |
| St. Pétersbourg, Entomological Society, | | 1 |
| St. Pétersbourg, Jardin Impérial de Botanique, | | 1 |
| Sturgis, Mrs. Elizabeth O., Boston, | 1 | 1 |
| Sydney, Royal Society of New South Wales, | 1 | |
| Tasmania, Government of, | 1 | |
| Taunton, Eng., Somersetshire Archæological and Natural History Society, | 1 | |
| Taunton, Public Library, | | 1 |
| Thayer, C. P., Boston, | 1 | |
| Throndhjem, K. Norske Videnskabers Selskab, | | 2 |
| Tokio, University, | 1 | |
| Topeka, Kansas Academy of Science, | | 1 |
| Topeka, Kansas Historical Society, Newspapers, | 1 | |
| Toronto, Canadian Institute, | | 1 |
| Trenton, New Jersey State Library, | 1 | |
| Tyler, Arthur W., Indianapolis, | | 1 |
| Unknown, | 2 | 13 |

| | Vols. | Pam. |
|---|---|---|
| U. S. Bureau of Education, | 1 | 10 |
| U. S. Chief of Engineers, | 7 | |
| U. S. Department of the Interior, | 48 | 3 |
| U. S. Department of State, | 6 | |
| U. S. Life Saving Service, | 1 | |
| U. S. National Board of Health, | | 38 |
| U. S. National Museum, | 1 | 15 |
| U. S. Naval Observatory, | 3 | |
| U. S. Patent Office, | 2 | 53 |
| Van Voorhis, Elias W., New York, | 1 | |
| Walton, Eben N., | 8 | |
| Warren, George Washington, Boston, | | 1 |
| Warren, J. Collins, Boston, | | 1 |
| Washington, Smithsonian Institution, | 2 | |
| Waters, H. F., | | 1 |
| Waters, J. Linton, | 1 | 4 |
| Waters, Stanley, | 1 | 70 |
| Waterville, Me., Library of Colby University, | | 1 |
| Webster, John, | 6 | 173 |
| Weston, Edward S., | 41 | |
| Wheatland, Henry, | | 13 |
| Wheatland, Miss Martha G., | | 341 |
| Wheildon, William W., Concord, | 2 | 5 |
| Whipple, George M., | 2 | |
| Whitcher, Mary, Shaker Village, N. H., | | 130 |
| White, Rev. William O., Brookline, | 6 | 28 |
| Whitney, Mrs. Mary W., Lawrence, | Newspapers, | |
| Wien, K. K. Zoologisch Botanische Gesellschaft, | 1 | |
| Wien, Verein zur Verbreitung Naturwissenschaftliche Kenntnisse, | 1 | |
| Wilder, Marshall P., Boston, | | 2 |
| Willson, Rev. E. B., | 1 | 72 |
| Winchell, N. H., Minneapolis, Minn., | 1 | 6 |
| Winsor, Justin, Cambridge, | | 50 |
| Winthrop, Robert C., Boston, | | 3 |
| Wisconsin State Board of Health, | | 1 |
| Woods, Mrs. K. T., | | 23 |
| Worcester, American Antiquarian Society, | | 2 |
| Worcester, Society of Antiquity, | | 5 |
| Wright, Frank V., | 2 | |
| Würzburg, Physikalisch—medicinische Gesellschaft, | | 1 |
| Zurich, Naturforschende Gesellschaft, | | 7 |

The following have been received from editors or publishers :—

American.
American Journal of Science.
American Naturalist.
Antiquarian Papers.
Appleton's Literary Bulletin.
Beverly (N. J.) Banner.
Canadian Naturalist.
Cape Ann Bulletin.
Danvers Mirror.
Essex Co. Statesman.
European Mail.
Fireside Favorite.
Francis' Catalogue.
Gardener's Monthly and Horticulturist.
Hammatt Papers.
Ipswich Chronicle.
Lawrence American.
Lynn Bee.
Marblehead Messenger.
Medical Register.
Musical Herald.
Nation.
Naturalists' Leisure Hour and Monthly Bulletin.
Nature.
Newton Transcript.
Our Dumb Animals.
Peabody Press.
Publishers' Weekly.
Quaritch's Catalogue.
Sailors' Magazine and Seamen's Friend.
Salem Gazette.
Salem Observer.
Salem Post.
Salem Register.
Turner's Public Spirit.
Ward's Natural Science Bulletin.
Zoologischer Anzeiger.

An Art Exhibition, of the work of artists in Salem and vicinity, was held in May last; opening on Wednesday evening, May 18, 1881, and closing on Saturday evening, May 28, 1881. It included oil paintings, water colors, sketches in charcoal, pen and ink, and etching, also decorated china and pottery, embroideries and needle-work. The whole number of articles was 402. The following is a list of contributors :—

| *Subjects.* | *Artists and Exhibitors.* |
|---|---|
| Two oil paintings and plaque, | Minna P. Needham. |
| Five oil paintings, | Albert I. Whipple. |
| Seven paintings, | Miss L. L. A. Very. |
| Three water colors, | Mrs. H. M. Chase. |
| Two sketches—exhib., | G. L. Chandler. |
| Decorated umbrella stand, | Miss A. S. Wardwell. |
| Pencil drawing, etc., | Mrs. S. K. Hart. |
| Five decorated articles, | Miss E. G. Peirce. |
| Six butter plates and plaque, | Miss L. C. G. Peirce. |

| | |
|---|---|
| Oil nasturtiums, | Miss E. A. Nichols. |
| Pottery, etc., | Miss Louisa Lander. |
| Five oil and charcoal drawings from life, | Miss M. P. Kilham, Beverly. |
| Two tiles and pitcher, | Miss H. M. King. |
| Eleven oil paintings, | Miss Alice Hanson, Danvers. |
| Nine oil paintings, | Mr. Jos. Ropes. |
| Two paintings, | Miss L. W. Whipple. |
| Seven paintings, | Miss L. Lander. |
| Two birthday cards, | Mrs. W. H. A. Putnam. |
| Five sketches, | Miss H. E. Carlton. |
| Six cups and saucers, | Miss S. S. Kimball. |
| Lamp screen, etc., | Miss K. Cloutman. |
| Bag and tidy, | Miss A. E. Cloutman. |
| Three paintings, | pupils of Miss Oliver. |
| Eight paintings, | Miss S. E. C. Oliver. |
| Study and panels, | Miss C. Goldthwaite. |
| Study and panels, | Miss Helen Brown. |
| Panel, etc., | Miss A. M. Quimby. |
| Painting, | Thos. A. L. McGowen. |
| Umbrella stand, | Miss Amy S. Wardwell. |
| Two water colors, | Mrs. K. T. Woods. |
| Panel, | Miss L. L. Read. |
| Painting, exhib., | Mrs. George Upton. |
| Four studies, | Miss M. L. Webb. |
| Four ornaments, | Mrs. E. S. Johnson. |
| Table cloth, | Mrs. Chas. S. Osgood. |
| Eight sketches, | Miss S. E. Smith. |
| Two sketches, | pupils of Miss S. E. Smith. |
| Copy, | Miss S. W. Pickering. |
| Panel, | Mrs. N. G. Symonds. |
| Two charcoals, | R. C. Manning, Jr. |
| Cup and saucer, | Mrs. J. T. Mooney. |
| Nine decorated articles, | Miss L. B. How. |
| Screen, | Miss Sophie Harris. |
| Four paintings, | Mr. Geo. W. Harvey. |
| Embroidery, | Leonnette Luscomb. |
| Pair of storks, | Mrs. Joseph Symonds. |
| Pair of storks, | Miss S. Kelly. |
| Tidy, panels, etc., | Mrs. Jas. Roberts. |
| Sofa pillow, etc., | Miss E. R. Edmunds. |
| Five paintings, | Miss M. E. Phippen. |
| Embroidered India dress, | Mrs. J. C. Osgood. |
| Embroidery, | Mrs. G. B. Jewett. |
| Miniature, | Miss Osgood. |

| | |
|---|---|
| Poppies, | Miss C. Chase. |
| Plates, etc., | Miss M. L. King. |
| Miniature, exhib., | Mrs. S. J. Ireson. |
| Panel, etc., | Mrs. J. R. Emery. |
| Four decorated articles, | Miss A. F. Perkins. |
| Twelve butter plates, | Miss A. G. Endicott. |
| Six specimens inlaid work, | Mr. E. C. Larrabee. |
| Embroidery, | Miss C. G. Grant. |
| Cups and saucers, | Miss A. B. Holden. |
| Embroidery, | Mrs. Geo. Harrington. |
| Two studies, | Miss A. S. Symonds. |
| Eight oil and water colors, | Mr. J. J. Redmond. |
| Two plaques, | Miss G. M. Benson. |
| Two plaques, | Miss E. U. Benson. |
| Decorated bottle, | Mrs. G. W. Benson. |
| Six sketches, | Frank W. Benson. |
| Marine view, | John P. Benson. |
| Three decorated articles, | Miss E. W. Chadwick. |
| Six paintings, | Miss M. M. Brooks. |
| Three paintings, | Mr. C. C. Redmond. |
| Two water colors, | Miss F. G. Babson. |
| Panels, etc., | Miss E. B. Gardner. |
| Two paintings, exhib., | J. J. Muhlig. |
| Nine paintings, | H. F. Osborne. |
| Six water colors, | A. H. Hayward. |
| Decorated articles, | L. E. Merrill. |
| Three articles, | Miss S. F. Upton. |
| Four decorated articles, | Mrs. N. A. Frye. |
| Decorated articles, | Miss A. B. Willson. |
| Six water colors, | C. K. Bolles. |

The following are exhibitors of single articles:—Miss K. Phillips, Miss E. Ropes, Miss I. Jackson, Miss C. Harrington, Miss A. E. Smith, Mrs. Nathan Frye, Mrs. J. Kimball, Mrs. L. T. Savory, Miss F. Osborne, Miss Mary L. Webb, Miss Louisa Pierson, Miss A. Batchelder, S. S. Peele, Mrs. Emilio, N. C. Harris, Miss A. L. Short, Miss A. B. Holden, Miss C. L. Read, Miss L. S. Gifford, Miss A. Machado, Miss M. J. Ashby, Miss M. Whipple, Miss Edith Dalton, Mrs. C. Osgood, Miss E. W. Fiske, L. F. Endicott, Miss J. F. Pinkham, Miss A. Pingree, Miss S. E. Smith, Miss C. H. Sweetzer, Miss J. Purbeck, Miss H. E. Carlton, Mrs. J. C. Abbott, Miss N. J. Brown of Peabody, Mrs. E. H. Trumbull, Miss L. P. Robinson, Miss A. S. Tukey, Miss H. L. Kimball, John C. Chadwick, Dr. A. M. Dudley, Miss Mary Stevens.

Frequent and valuable additions to the art library are

made by the curator of art, and the number of persons interested in this subject who consult this library is increasing. Many of the volumes contain useful and valuable information which the student could not easily obtain elsewhere.

Horticultural Exhibition.—The annual exhibition of flowers and fruit opened at the rooms of the Essex Institute on Wednesday, Sept. 7. Although the display was not so large as that of some previous seasons, the collection was on the whole quite as interesting as any of the society's exhibitions. The general arrangement of the hall under the care of the curator of horticulture, Mr. J. Endicott Peabody, was very tasteful, and the plants and flowers were displayed to their best advantage. Among the most noteworthy exhibits were the collection of greenhouse ferns and other pot plants of S. E. Peabody, the fine collection of Coleus of H. W. Putnam, the beautifully arranged bank of cut flowers of Mrs. L. P. Weston of Danvers, the Ferns and Begonias of John Robinson, the seedling Gladioli of C. A. Putnam, and the cut flowers of Miss Mary Ropes. Fruit was exhibited by F. Lamson, J. P. Cook, Wm. Mack and Wm. A. Ireland. Cut flowers by Mary K. Robinson, George D. Phippen, and others. A finely arranged basket of flowers was shown by George W. Peabody, and a specimen of the cotton plant by John Webster.

Among the curiosities were the smallest fern grown in America, the "Trichomanes petersii," from Alabama, contributed by Mr. John Robinson; an exceedingly curious water plant, contributed by Dr. H. C. Merriam; and a cotton stock raised on the Red River in Louisiana, near the Texas line, planted April 1, and taken up the latter part of August, and presented to Mr. John Webster. Mr. S. E. Peabody and Mr. John Robinson contributed

a fine exhibit of ferns, pot plants and begonias. Mr. H. W. Putnam had a splendid show of coleus, and C. A. Putnam exhibited a beautiful display of gladioli, as did also Mr. James J. H. Gregory of Marblehead. The exhibit of fruit and vegetables was as before stated necessarily meagre, owing to the season. Mr. Charles A. Ropes was the leading exhibitor of pears and apples. Mr. G. F. Brown came next, and Miss E. P. Richardson and Mr. James P. Cook had a creditable display of pears. Mr. S. Endicott Peabody showed some magnificent grapes, and Mr. Fred Lamson some luscious peaches and exceedingly roseate apples. The vegetables formed a very creditable display and were from Kernwood.

The following awards were made: Greenhouse and stove plants, best twelve varieties, premium $10, to S. E. Peabody; foliage plants, best six varieties, premium $5, to S. E. Peabody; cut flowers, best display, premium $5, to Mrs. L. P. Weston of Danvers; same, second premium, $3, to Miss M. T. Ropes, Salem; gladioli, first premium $5, to C. A. Putnam; gladioli, second premium, James J. H. Gregory; coleus, best display, gratuity $5, to H. W. Putnam; ferns, best six named, premium $5, to S. E. Peabody. Pears, best twelve Bartletts, premium to G. H. Frye; pears, best six of any kind, premium to George F. Brown; same, second premium, W. A. Ireland; apples, Gravensteins, gratuity $3, to Charles A. Ropes; same, Rhode Island Greening, gratuity $2, to Charles A. Ropes; grapes, best bunches white foreign, premium to S. E. Peabody; grapes, best "Black Hamburgs," premium to Jacob C. Rogers, Oak Hill, Peabody; peaches, first premium and second premium to Fred Lamson, Salem, "Early Crawford" and "Haley's Early."

The following were the entries:

*Apples.*—C. A. Ropes, Fred Lamson.

*Pears.*—C. A. Ropes, George F. Brown, Miss E. P. Richardson, William A. Ireland, J. P. Cook.

*Apricots.*—Mrs. Wilkinson of Beverly.

*Peaches.*—Fred. Lamson, E. Goss, W. A. Ireland.

*Grapes.*—S. E. Peabody, Jacob C. Rogers, C. A. Ropes, E. Goss.

*Bartlett Pears.*—George F. Brown, James B. Dugan, S. E. Peabody, C. A. Ropes, G. H. Frye, J. P. Cook, Miss E. P. Richardson.

*Vegetables and Melons.*—S. E. Peabody.

*Pot Plants and Ferns.*—S. E. Peabody, John Robinson, Dr. H. C. Merriam, G. Bailey, Annie S. Brooks, Helen Philbrick.

*Gladioli.*—J. J. H. Gregory, C. A. Putnam.

*Coleus.*—H. W. Putnam, S. E. Peabody.

*Cut Flowers.*—G. F. Brown, Miss M. K. Robinson, Mrs. L. P. Weston, Miss M. T. Ropes, William A. Ireland, J. J. H. Gregory, G. W. Peabody, F. Lamson, John Robinson, George D. Phippen.

It is interesting to note the great change that has taken place in the character of the exhibitions of to-day, as compared with those of forty years ago. We now miss from the stands the large collections of dahlias of every shade of coloring, from the gardens of the Putnams, Ropes, Driver, Upton, Oliver, Thayer, the Phippens and others; also the great variety of annuals, roses, lilies, etc., sent by various contributors. From the tables, the great collection of pears numbering some hundreds of varieties, the plums of fifty or more kinds, also apples, peaches, etc., from the well known pomological garden of Robert Manning, whose name is prominent in the annals of pomology; grapes in variety (cultivated under glass) from the houses of Allen, Lee, Silsbee, West, Dean, Hoffman, Pickman, Bowker, Gardner and others. The large collections of fruits, principally pears, from

Lee, Cabot, Putnam, Upton, Emmerton, Mansfield, Ives, etc.

Scarcely a pot plant or any of the well known vegetables were on exhibition. The cut flowers and the fruit occupied every available space in the rooms. The dahlia, once so prominent, has almost disappeared; the few that are seen may be considered as representatives of a previous age. The annuals, once so highly prized, have given place to the collections of foliage plants, ferns, begonias, caladiums, etc. The vegetables, in great variety, now receive merited attention in all horticultural displays.

The change in the specimens exhibited is no greater than in the exhibitors. That generation has nearly all passed away; and their children, and those who have since that time become residents of our city, remain to carry forward the work so auspiciously commenced.

Museum.—The specimens in natural history, including those in archæology, which have been given during the year, are on deposit with the Trustees of the Peabody Academy of Science, in accordance with previous arrangements. Those of an historical character or that possess an artistic interest have been arranged in the rooms. The following may be specified as contributors: Mrs. Samuel G. Ireson, F. A. Fielden, C. T. Brooks of Newport, R. I., Mrs. N. D. Cole, Miss Nellie Jackson, Gardner L. Chandler, Charles O. Welch, James Shatswell, Henry M. Brooks, James L. Putnam, S. Grindall of Augusta, Me., James S. Bryant, of Hartford, Conn., Stephen Henry Osborn, E. N. Walton, Benjamin Knights, S. A. Green, of Boston, Wm. P. Andrews, E. C. Bolles, John Robinson, R. S. Rantoul, S. A. Jones, George D. Phippen, Mrs. Sarah H. Swan, of Cambridge, Esther C. Mack, Miss C. P. Chadwick (estate of), James A. Emmerton.

FINANCIAL.—The Treasurer's Report of the receipts and expenditures of the past year (condensed for printing).

## RECEIPTS.

*General Account.*

| | | |
|---|---|---|
| Balance on hand at commencement of year | | $69 76 |
| Dividends of stocks, | $25 00 | |
| Return state tax, | 11 05 | |
| Assessments of members, | 934 00 | |
| Publications, | 550 65 | |
| Lectures, Concerts, Excursions, Hall, etc., | 829 11 | |
| Salem Athenæum, | 210 34 | |
| | | $2560 15 |
| *Hist. Soc. Fund.* | | |
| Dividends of stocks, | | 25 00 |
| *Nat. Hist. Soc. Fund.* | | |
| Dividends of stocks, | | 36 00 |
| *Davis Fund.* | | |
| Interest of bonds, | | 407 30 |
| *Ditmore Fund.* | | |
| Interest of bonds and stocks, | | 180 40 |
| *Manuscript Fund.* | | |
| Interest of Savings Bank, | | 22 10 |
| *Ladies' Fair Fund.* | | |
| Interest of bond, | | 60 00 |
| *Derby Fund.* | | |
| Sale of land and rent, | | 417 50 |
| *Howes Fund.* | | |
| Interest of bonds, | | 1.490 00 |
| | | $5,268 21 |

## EXPENDITURES.

*General Account.*

| | | |
|---|---|---|
| Salem Athenæum, | $350 00 | |
| Salaries, | 1,752 81 | |
| Publications, | 1,881 62 | |
| Fuel, | 152 50 | |
| Repairs, Express, Postage, etc., | 294 06 | |
| | | $4,430 99 |
| *Historical.* | | |
| Books and binding, | | 210 98 |
| *Natural History and Horticulture.* | | |
| Book-binding, etc., | | 90 00 |
| *Ditmore Fund.* | | |
| Mr. Perkins' annuity, | | 110 00 |
| *Manuscript Fund.* | | |
| Savings Bank, interest added to fund, | | 22 10 |
| *Davis Fund.* | | |
| Savings Bank, interest added to fund, | | 27 30 |
| Balance cash on hand, | | 376 84 |
| | | $5,268 21 |
| The invested funds of the Institute are, | | $37,665 43 |

AN AMENDMENT TO THE ACT OF INCORPORATION granted by the Legislature of 1882, on the petition of the Institute.

AN ACT to authorize the Essex Institute to hold additional personal estate.

*Be it enacted, etc., as follows:*

SECT. 1. The Essex Institute, incorporated by chapter five of the acts of the year eighteen hundred and forty-eight, is hereby authorized to hold personal estate, exclusive of the books, papers and articles in the cabinets of said corporation, to an amount not exceeding one hundred thousand dollars.

SECT. 2. This act shall take effect upon its passage.

[*Approved February 24, 1882.*]

The Secretary closes his annual report in the following words:

"Thousands of pamphlets and newspapers have found their way to our rooms during the year. Many hundred volumes of books of more or less value have also been given to the society, and each year comes the question where shall such material be deposited? The shelving capacity of the building is exhausted. Many valuable historical pictures and prints are lying unseen in various places about the rooms for want of proper hanging space. It is known that portraits of great value and of much historical interest would come to the Institute, if secure and fire-proof accommodations were offered. Could the means be supplied to meet the imperative need, there can be no doubt that large additions would be made to the various departments of the Institute, thereby largely increasing its usefulness in our own county, and its importance among the historical societies of the country."

BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 14. SALEM: JULY TO DEC., 1882. NOS. 7–12.

# CARCINOLOGICAL NOTES; NUMBER V.[1]

BY J. S. KINGSLEY.

IN the present number of these notes I have gathered a number of new species and remarks on little known forms of macrurous Crustacea, the results of my studies of the collections at Salem, Boston and Philadelphia, together with outline illustrations of some hitherto unfigured forms.

## Genus **PENÆUS** FABR.

Mr. E. J. Miers has recently given a revision of the species of this genus (Proc. Zool. Soc'y, London, 1878, pp. 298–310) and I would here give the localities of the specimens which I have examined.

### Penæus affinis.

Specimens in the Museum of the Peabody Academy of Science, Salem, Mass., from Hawaian Islands (A. Garrett), Hong Kong (Capt. W. H. A. Putnam), Zanzibar (Capt. Webb).

[1] The previous articles of this series may be found in the Proceedings of the Academy of Natural Sciences of Philadelphia for 1880. (No. I, pp. 34–37; No. II, pp. 135–155, pl. X; No. III, pp. 179–186; No. IV, pp. 187–224.)

**Penæus amazonicus.**

Specimens in the Museum of the Boston Society of Natural History from the upper Amazon (James Orton).

**Penæus avirostris** Dana.

Boston Society: Japan (E. S. Morse).

**Penæus braziliensis** Latr.

*P. brevirostris* Kingsley.

Boston Society: Trinidad (W. O. Crosby), Bahamas (Dr. Henry Bryant). Union College: Sarasota Bay, Marcou Pass and Charlotte Harbor, Fla., Beaufort, N. C. (H. E. Webster). Peabody Academy: Rio Grande, Brazil (Capt. Harrington); Bahia, Brazil (Prof. C. F. Hartt); Magdalena River, New Granada (A. P. Smith); Realigo, West coast of Nicaragua (J. A. McNiel).

**Penæus brevicornis** M.-Edw.

Peabody Academy: China (Capt. W. H. A. Putnam).

**Penæus canaliculatus** Oliv.

Boston Society: Japan (Prof. E. S. Morse).

**Penæus constrictus** Stimp.

Union College: Marcou Pass, Fla. (H. E. Webster). Peabody Academy: Ft. Jefferson, Fla. (Lieut. Jacques).

**Penæus kroyeri** Heller.

*Xiphopeneus hartii* Smith.

Peabody Academy: Abrolhos, Brazil (Prof. C. F. Hartt).

**Penæus monocerus** Fabr.

Peabody Academy: Whampoa, China (Capt. W. H. A. Putnam).

**Penæus monodon** Fabr.

Peabody Academy: Hong Kong (Capt. W. H. A. Putnam).

**Penæus sculptilis** Heller.

Peabody Academy: Pulo Penang (Capt W. H. A. Putnam).

**Penæus semisulcatus** Dr. Haan.

Peabody Academy: Singapore (Capt. W. H. A. Putnam).

### Penæus setiferus Linn.

Boston Society: Guatemala (C. H. Van Patten), Port Orange, Fla. (S. N. Chamberlain). Peabody Academy: Charleston, S. C. (A. S. Packard, jr.).

## Genus PALÆMON Fabr.

### Palæmon africanus n. s.

Carapax microscopically granulate, hepatic spine present. Rostrum shorter than the antennal scales, with nine or ten teeth above and five or six below, the tip three toothed. First pair of feet slender; the middle of the carpus extending as far forward as the tip of the antennal scale; hand about one-third the length of the carpus, fingers with pencils of hairs. Second pair of feet equal, greatly elongate and armed with longitudinally arranged spiniform tubercles; the meros is shorter than the carpus and about equal to the palm. Carpus slightly shorter than the hand, fingers occupying from one-third to two-fifths of the manus, completely closing, the occludent margins smooth, toothless and covered with hairs. Its nearest allies are *P. idæ* Heller, from which it differs in the shorter carpus and longer meros; *P. acanthurus*, which has a longer and reflexed rostrum, and *P. japonicus* de Haan, in which the first pair of feet are much longer. It may prove to be *P. macrobrachion* Hecklots (Addit. Faun. Africam Occid.) but the description of that species is too imperfect to decide the question.

West coast of Africa; P. du Chaillu (Philadelphia Academy). West coast of Africa; Dr. Perkins (Boston Society of Natural History, *type*).

### Palæmon grandimanus Randall.

The types (two in number) of this species are still preserved in the Philadelphia Academy.

### Palæmon jamaicensis (Herbst) Oliv.

*P. carcinus* Leach, Zool. Misc., ii, p. 92, pl. 92, 1815.
*P. punctatus* Randall, Jour. Phil. Acad., viii, p. 145, 1839.

An examination of Randall's type of *P. punctatus*, which is preserved in the museum of the Philadelphia Academy of Natural Sciences, shows it to belong to the well-known *P. jamaicensis*. In the same collection are specimens from St. Martin's (Dr. Rigjersma), San Domingo (W. M.Gabb), Guatemala (W. S. Vaux), Cuba (Guerin), Brazil (Dr. T. B. Wilson). In the Peabody Academy of Science there are specimens brought by J. A. McNiel from Polvon, on the west coast of Nicaragua.

### Palæmon longimanus Fabricius.

*P. longimanus* Fabr., Suppl. Ent. Syst., p. 402, 1798.
*P. lar* Fabr., l. c., p. 402, 1798.
*P. ornatus* Oliv., Encyc. viii, p. 660. Edw. Hist. Nat Crust., ii, 396, 1837.

These three descriptions were doubtless drawn from individuals of the same species, and of the two Fabrician names I have chosen *longimanus* to stand for the species, as it is to a certain extent descriptive.

### Palæmon ohionis Smith.

This species was described by Professor Smith from specimens taken in the Ohio river at Cannelton, Indiana. Prof. S. A. Forbes (Bulletin Ill. Mus. Nat. Hist., i, p. 5, 1876) reports it from several places in Illinois and, on the authority of boatmen, from St. Louis to New Orleans, growing larger towards the south. I have seen specimens in the museum of the Boston Society of Natural History from Milliken's Bend, Miss. (C. A. Shurtleff), and in the Museum of the Academy of Natural Sciences of Philadelphia, from Vicksburg, Miss. (L. C. Rice) and Mississippi (Guerin-Meneville, types of *P. sallei* Guer. MS.).

### Palæmon sinensis Heller.

Specimens of this species, which was originally described from Shanghai, were brought from Japan by Prof. E. S. Morse and are now in the museum of the Boston Society of Natural History.

### Palæmon acanthurus Wiegmann.

*P. forceps* Milne-Edwards.

Three specimens of this species in the Museum of the Peabody Academy brought by J. A. McNiel from the west coast of Nicaragua. It has hitherto been known only from the eastern shores of this continent.

## Genus LEANDER Desmarest.

### Leander hammondii n. s. Pl. I, fig. 2.

Carapax smooth; rostrum elongate, a fifth longer than carapax and considerably recurved, its dorsal margin armed with nine or ten nearly equidistant teeth, the two posterior being on the carapax; inferior margin six-toothed, the apex bifid. Last two joints of antennular peduncle subequal, and together about equalling the preceding joint. The two basal joints armed externally with a slender spine, each of which extends beyond the middle of the succeeding joint. Three

antennular flagella, the two outer (and stouter) branches being united for about a fifth of their length. Antennal scale narrow and very long, nearly equalling the rostrum in length. Antennal flagellum slightly longer than the whole body. External maxilliped hirsute, small, slender and not reaching beyond the tip of the antennular peduncle. First pair of feet slender, extending half way between tip of antennular peduncle and the apex of the rostrum. Second pair also slender; ischium, meros, and carpus sub-equal. Palm inflated, fingers about equal to palm, depressed, slender and gaping, and extending their whole length beyond the rostrum. Remaining feet slender, propodal joints spinulose beneath. Telson slender, triangular, with four dorsal aciculi and its apex armed with four small spines, the two outer ones the shorter. Length of body 29 mm., carapax 13 mm., second pair 15 mm.

The specimens on which this species is founded are in the museum of the Peabody Academy of Science at Salem, Mass. (no. 171), and were brought from Baker's Island, North Pacific, by Capt. Joseph Hammond, who for many years has been in charge of the Exhibition Rooms of the Academy and for whom I have named the species. Its closest relative seems to be *L. modestus* Heller (Verh. k. k. zool. bot. Gesellschaft in Wien xii, pl. 527, 1862) from Shanghai, from which it appears to differ in the shape of the rostrum, hands, etc.

### Genus **Anchistia** Dana.

*Anchistia Americana*, Kingsley, Proc. Acad. Nat. Sci., Philadelphia, 1878, p. 96.

A few details of this species are given on plate II, fig. 10.

### Genus **ALPHEUS** Faber.

(Including *Betæus*, Dana.)

Notwithstanding the remarks of my friend Mr. Lockington (Ann. & Mag. Nat. Hist. V, i, p. 466, 1878), I am still of the opinion that these two genera should be united and the examination of many hundred specimens of the two forms in the largest museums of America, only renders me more certain of my position. Mr. Miers says (Proc. Zoöl. Soc., 1879, p. 52): "There is probably scarcely any genus of Crustacea in which the species are more numerous, and which more greatly needs revision than the present," with which I fully agree. I commenced a revision some three years ago, but for several reasons I have been unable to finish it. Moreover, some sheets of my manuscript having been mislaid I cannot give this list of species that completeness which I could wish and which it once possessed. Still it is to be

hoped that the following notes which embrace almost every species, nominal or otherwise, will aid some future reviser in the work.

To aid in the identification of forms I have thrown the species into groups characterized by more or less prominent features; but there remain a number of nominal forms which (either from inadequacy of description or from the works in which they are published being inaccessible to me) are not so arranged.

A. Rostrum present; orbital hoods prolonged into spines.

a. Dactylus of 1st pair normal, *i. e.*, working in a vertical plane and above the pollex.

* Larger hand constricted above and below.

§ A spine on basal joint of antenna.

### Alpheus megacheles *Norman.*

*Hippolyte rubra* Westwood. Mag. Nat. Hist., viii, p. 272 (1835); *non Alpheus ruber* Edw. *ex* Rafinesque.

*Hippolyte megacheles* Hailstone. Mag. Nat. Hist., viii, p. 395 (1835).

*Dienecia rubra* Westwood, *l. c.*, p. 552 (1835).

*Alpheus edwardsii* Edwards. Hist. Nat. Crust., ii, p. 352 (1837); Dana U. S. Exp. Exp. Crust., p. 543, pl. xxxiv, fig. 2 (1852); *non* Audouin.

*Alpheus affinis* Guise. Ann. & Mag. N. H., II, xiv, p. 275 (1854).

*Alpheus platyrhynchus* Heller. Sitzungsber. K. Akad., Wien, xliv, i, p. 400, pl. 1, f. 21–24 (1862).

*Alpheus milnei* Guerin, in De Sagra's Hist. Cuba, Crust., p. xlix (1857).

*Alpheus megacheles* Norman. Ann. & Mag., N. H., IV, ii, p. 175 (1868).

England to the Mediterranean (Auct.).

### Alpheus thetis *White.* Pl. II, fig. 7.

*Alpheus thetis* White. List Crust. Brit. Mus., p. 75 (1847) *sine descr.* Miers Zoöl. Voyage Erebus & Terror, Crustacea, p. 5, pl. iv, f. 7 (1875).

The following description giving some details additional to those of Mr. Miers, is drawn from two specimens in the museum of the Academy of Natural Sciences of Philadelphia, presented by Dr. T. B. Wilson and labelled in Adam White's handwriting. They agree well with the figure quoted above and may be regarded as typical.

Front three spined, rostrum slightly longer than the ocular spines and separated from them by deep sulci. Second joint of antennular peduncle much the longest, the peduncle equalling the antennal scale in length. External maxillipeds much exceeding the antennal scales.

Larger hand longer than the carapax and shaped much as in *A. strenuus* Dana, but more elongate. Both margins are constricted and a well marked longitudinal sulcus runs backward on the lower margin. The inner and outer surfaces of the hand are sulcate. The fingers are nearly as long as the palm, the dactylus being slightly longer than the pollex. The carpus of the second pair is five jointed; first joint as long as the next two, second as long as the third and fourth, which are equal and together are as long as the fifth. The hand is about as long as the fourth and fifth carpal joints together.

New Zealand! (Dr. Wilson, Phil. Acad.); New Holland (White).

### Alpheus bellimanus *Lockington.*

*Alpheus bellimanus* Lockington. Proc. Cal. Acad., vii, p. 34 (1876); Ann. & Mag. Nat. Hist., V, i, p. 470 (1878).

San Diego, Cal. (Lockington).

### Alpheus sulcatus *Kingsley.*

*Alpheus sulcatus* Kingsley. Bull. U. S. Geol. Surv., iv, p. 193 (1877).

Panama! and Zorritas, Peru! (F. H. Bradley, Yale College).

### Alpheus dentipes *Guerin.*

*Alpheus dentipes* Guerin. Exp. Sci. Morée, Zoöl., p. 39, pl. xxvii, f. 3 (1832).

Mediterranean (Guerin, Lucas and Heller).

### Alpheus equidactylus *Lockington.*

*Alpheus equidactylus* Lockington. Proc. Cal. Acad., vii, p. 35 (1876).
*Alpheus æquidactylus* Lockington. Ann. & Mag., N. H., V, i, p. 472 1878.

Monterey, Cal. (Lockington).

§§ No spine on basal joint of antenna.

### Alpheus Websteri *Kingsley.* Pl. II, fig. 5.

*Alpheus Websteri* Kingsley. Proc. Acad. Nat. Sci., Philadelphia, p. 416 (1879).

In this species the constriction on the lower margin of the palm is very slight and possibly it should be placed near *A. lottinii* (*infra*), but it appears, however, to be more closely allied to *Alpheus sulcatus* than to any other form. The types are in the collection of Union College and were brought from Key West, Fla., by Prof. H. E. Webster, to whom the species is dedicated.

### Alpheus euchirus *Dana.*

Possibly this species should be arranged here. I have, however, placed it in the section with contorted hands. The dactylus works slightly out of the vertical plane.

** Larger hand notched above, entire below.

§ A spine on basal joint of antenna.

### Alpheus gracilipes *Stimpson.*

*Alpheus gracilipes* Stimpson. Proc. Acad. Nat. Sci., 1860, p. 31.
Tahiti (Stimpson).

### Alpheus malleator *Dana.*

*Alpheus malleator* Dana. U. S. Exp. Exp. Crust., p. 557, pl. 35, f. 9 (1852).
Rio Janeiro?! (Wilkes Exp., Phil. Acad.).

### Alpheus gracilis, *Heller.*

*Alpheus gracilis* Heller. Sitzungsber. k. Akad., Wien, xliv, i, p. 271, pl. III, figs. 19–20 (1862).
Red Sea (Heller).

§§ No spine on basal antennal joint.

### Alpheus trispinosus *Kingsley.*

*Betæus trispinosus* Stimpson. Proc. Acad. Nat. Sci., p. 32 (1860).
*Alpheus trispinosus* Kingsley. Bull. U. S. Geol. Surv., IV, 190 (1878).

What reason Dr. Stimpson had for calling this a *Betæus* I cannot imagine; for, according to his description, it has a long rostrum and the larger hand is not inverted, the only characters given for the genus *Betæus* by Dana.

Port Jackson, Australia (Stimpson).

*** Larger hand with both margins entire.

§ First joint of carpus of second pair of feet shorter than, or at the most equal to, the second and third joints. A spine on the basal joint of the second antenna.

### Alpheus socialis *Heller.*

*Alpheus socialis* Heller. Reise der Novara, Crustaceen, p. 106, pl. 10, f. 1 (1865); Miers Catalogue New Zealand Crustacea, p. 82 (1876).
Auckland, Sydney (Heller); New Zealand (Miers).

### Alpheus panamensis *Kingsley.*

*Alpheus panamensis* Kingsley. Bulletin, etc., p. 192 (1877).

Acajutla, Central America! and Panama! (F. H. Bradley, Yale College Museum).

### Alpheus lottinii *Guerin.*

*Alpheus lottinii* Guerin. Voyage Coquille, Crustaces, p. 38, pl. III, f. 3 (1830).

*Alpheus ventrosus* Edw. Hist. Nat. Crust., ii, p. 352 (1837).

*Alpheus lævis* Randall. Jour. Acad. Nat. Sci., Phil., viii, p. 141 (1839); Dana U. S. Exp. Exp. Crust., p. 556, pl. XXXV, f. 8 (1852).

A comparison of the types of Guerin and of Randall shows the specific identity of the two so-called species. Guerin's figure is poor, that of Dana is far better. The bottle containing Guerin's type bears the label (in his handwriting) "303 *Alpheus lottini.* Guer. Voy. Coq. Edw. 2. 353, Ile de France;" while the manuscript catalogue of his collection (which was purchased by Dr. Thomas B. Wilson, and by him presented to the Academy of Natural Sciences of Philadelphia) has "303 *A. lottinii* Guer. Voy. Coq. Edw. 2. 353 (type) Nouvelle Irland, 1 Alk." In the published description Nouvelle Irland is given as the locality. Under these circumstances I am inclined to believe that the locality "Ile de France" was a slip of the pen.

New Ireland! (Guerin, Phil. Acad. *type*); Sandwich Islands! (T. Nuttall, Phil. Acad., Randall's *type*); Zanzibar! (C. Cooke, Peabody Acad.); Red Sea, Nicobar and Sydney (Heller); Fiji (Dana); Mauritius (Edw.); Society and Friendly Islands.

### Alpheus rouxii *Guerin.*

*Alpheus rouxii* Guerin, in De Sagra Hist. Cuba, Animaux Articules, p. 1 (1857).

Bombay (Guerin).

This in all probability is the same as the preceding. Guerin's description runs: "Très voisin de l'A. ventrosus, Edw., p. 352. Il en diffère par ses pattes mâchoires externes qui ne sont pas larges et obtuses au bout, mais qui sont, au contraire, larges à la base du dernier article, avec son extrémité effilée et aigüe; par l'article basilaire des antennes externes qui porte une forte épine atteignant presque la moitié de la piece lamelleuse du pédoncule."

### Alpheus ventricosus *Kingsley.*

*Cryptophthalmus ventricosus* Costa, Fauna Napoli, Crostacei, pl. vii, f. 3.[2]

I place this species in this section with some doubt, as I know nothing of the presence or absence of an antennal scale. Dr. Heller (Crustaceen des südlichen Europas, p. 272, 1863) regards this identical with his *Alpheus lævimanus*, but Costa's figure represents a widely different species. Dr. Heller also quotes as a synonym "*Cryptophthalmus costæ*, Prestandrea Nuovi annali d. sc. nat. 1838, p. 298," a paper which I have not seen. Dr. Heller's synonymy is, however, never to be relied upon.

§§ First joint of carpus of second pair of feet larger than the second and third together.

### Alpheus minus *Say.*

*Alpheus minus* Say. Jour. Acad. Nat. Sci., Phil., i, p. 245 (1818); Edw. Hist. Nat. d. Crust., ii, p. 536 (1837); Kingsley Bulletin, l. c., p. 190 (1877).

*Alpheus formosus* Gibbes. Proc. Am. Assoc. Adv. Sci., iii, p. 196 (1851).

*Alpheus tridentulatus* Dana. Proc. Phil. Acad., vi, p. 22 (1852); U. S. Exp. Exp. Crust., p. 552, pl. xxxv, f. 4 (1852).

*Alpheus saulcyi* Guerin, in De Sagra's Hist. Cuba, p. xlviii, pl. II, f. 8 (1857).

*Alpheus minor* Lockington. Ann. & Mag. N. H., V, i, p. 472 (1878).

Beaufort, N. C.! (H. C. Yarrow, Yale College); Florida! A. S. Packard, jr., Peabody Academy); Martinique! (Guerin's type of *A. saulcyi* in Philadelphia Academy); Bermudas! (G. B. Goode, Yale College); Panama! (F. H. Bradley, Yale College); Bahamas! (H. Bryant, Boston Society); Trinidad! (W. O. Crosby, Boston Society).

### Alpheus neptunus *Dana.*

*Alpheus neptunus* Dana. Proc. Phil. Acad., vi, p. 22 (1852); U. S. Exp. Exped. Crust., p. 553, pl. XXXV, f. 5 (1852).

*?Alpheus biungulatus* Stimpson. Proc. Phil. Acad., 1860, p. 31.

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[2] This work is one of the wonders of book-making. It has neither consecutive pagination nor systematic numbering of plates, there being half a dozen "Pl. I," and others in similar proportion. The parts themselves are not numbered, nor are the signatures dated or numbered. In the two copies which I have seen, the covers, in which the parts were issued, were wanting and so I can not give the dates. Some parts were apparently issued before the publication of the first volume of Milne Edwards' Classic (1834), while others were not written until 1851.

*?Alpheus lævisculus* Lockington. Ann. & Mag., V, i, p. 474 (1878); (*nec* Dana).

*?Alpheus charon* Heller. Verhandlung der zoöl.-bot. Gesellschaft in Wien, Bd. xi, p. 27 (1861).

The *Alpheus lævisculus* of Lockington is certainly the same as the *A. biungulus* of Stimpson.

Eastern seas. ? W. coast America.

### Alpheus spiniger *Stm.*

*Alpheus spiniger* Stm. Proc. Phil. Acad., 1860, p. 31.

Near Loo Choo (Stm).

### Alpheus tricuspidatus.

*Alpheus tricuspidatus* Heller. Verhandl. zoöl-bot. Gesellschaft in Wien, xi, p. 26 (1861).

Red Sea (Heller).

### Alpheus lævimanus *Heller.*

*Alpheus lævimanus* Heller. Sitzungsber. k. k. Akad., Wien, Bd. xlv, p. 403, pl. I, f. 25–27 (1862); Crust. s. Europa, p. 272 (1863); *non syn.*

Mediterranean (Heller).

### Alpheus tenuimanus *Lockington.*

*Alpheus tenuimanus* Lockington. Ann. & Mag. Nat. Hist., V, i, p. 473 (1878).

Gulf of California (Lockington).

The following species which belong in section *** I am not able to assign more nearly to their proper position, on account of insufficient detail in the descriptions and figures.

### Alpheus doto *White, Miers.*

*Alpheus doto* White. List Crust. in Brit. Mus., p. 75 (1847) *sine descrip.*; Miers Zool. Voy. Erebus and Terror, Crustacea, p. 5, pl. iv, f. 5 (1874).

Sir Charles Hardy's Island, Australia (Miers).

### Alpheus poeyi *Guerin.*

*Alpheus poeyi* Guerin, in De Sagra's Cuba, Crust., p. 1, pl. II, f. 10 (1857).

The type of this species is preserved, though in an imperfect condition, in the museum of the Philadelphia Academy.

Cuba! (Guerin).

### Alpheus bidens Edw.

*Palæmon bidens* Olivier, Encyclopedie Methodique, viii, p. 663 (1790).
*Alpheus bidens* M. Edw. Hist. Nat. Crust., ii, p. 353, pl. XXIV, f. 11–12 (1837).

In Milne Edwards figure (*l. c.*) this species is represented as having a four jointed carpus, probably an error on the part of the artist.

Asiatic seas (M. Edw.), New Holland (Olivier).

### Alpheus villosus Edw.

*Palæmon villosus* Olivier, l. c., p. 664 (1790).
*Alpheus villosus* Edw. Hist. ii, p. 354 (1837).

Asiatic seas (Edw.), New Holland (Oliv.).

### Alpheus spinifrons Edw.

*Alpheus spinifrons* Edw. Hist. etc., ii, p. 355 (1837).

*Alpheus panamensis* Kingsley, may prove to be this species but only a study of Milne Edwards type can determine; his description is utterly inadequate and would apply to several other species as well.

Chili (Edw.).

### Alpheus savignyi Guerin.

*Athanas nitescens* Audouin (*nec* Leach) Expl. Pl. Savigny, p. 274, pl. 9, f. 4 (teste Guerin).
*Alpheus savignyi* Guerin, in De Sagra's Hist. Cuba, Animaux Articules, p. xlix (1837).

Egypt (Savigny).

### Alpheus comatularum Haswell.

*Alpheus comatularum* Haswell, Catalogue of Australian Crustacea, p. 189 (1882).

Queensland (Haswell).

b. Hand contorted, the dactylus working either in a horizontal plane or in a vertical one below the pollex.

* No spine on the basal joint of the antenna.

### Alpheus streptochirus Stm.

*Alpheus streptochirus* Stm., Proc. Phil. p. 30 (1860).

Cape Verdes Is. (Stm.).

### Alpheus brevipes Stm.

*Alpheus brevipes* Stm. Proceedings Phil. Acad., p. 30 (1860).

Hawaiian Is. (Stm.)

### Alpheus barbara Lockington.

*Alpheus barbara* Lckn.

*Alpheus clamator* Kingsley, Bull. U. S. Geol. Survey, iv, p.

### Alpheus euchirus Dana.

*Alpheus euchirus* Dana.

** A spine on the basal joint of the antennæ.

### Alpheus clamator Lockington.

*Alpheus clamator* Lock., Proc. Cal. Acad. vii, p. 43 (1876) Ann. and Mag. N. H.

Sta. Barbara Is. (Lock.),

### Alpheus collumianus Stm.

*Alpheus collumianus* Stm., Proc. Phila. Acad., p. 30 (1860).

Bonin Is. (Stm.)

The following species belong in the section with the three-spined front (A) but no details are given of the hands and so their affinities cannot be recognized from the descriptions given.

### Alpheus acutofemoratus Dana.

*Alpheus acutofemoratus* Dana, Proc. Phil. Acad., vi, p. 22 (1852) U. S. Ex. Crust. p. 550, pl. XXXV, f. 2 (1852).

Balabac Straits (Dana).

### Alpheus monoceros Heller.

*Alpheus monoceros* Heller, Sitzungsberichte, K. Acad. Wiss. Wien, xliv, p. 274 (1862).

Red Sea (Heller).

B. Rostrum spiniform, ocular hoods rounded, not spiniform.

a. Basal joint of antennal with an external spine.

* Larger hand constricted above and below.

§ First joint of carpus of second pair longer than the second joint.

**Alpheus parvirostris** Dana.

*Alpheus parvirostris* Dana, Proc. Phila. Acad. vi, p. 22 (1852) U. S. Ex. Ex. Crust. p. 551, pl. XXXV, f. 3 (1852).

Balabac Straits (Dana), Red Sea (Heller).

**Alpheus diadema** Dana.

*Alpheus diadema* Dana, Proc. Phila. Acad. v, p. 23 (1852) U. S. Exp. Exped. Crust. p. 555, pl. XXXV, f. 7 (1852).

In this species the constriction of the larger hand is very slight and possibly the affinities are with *A. fasciatus*, *infra*, and the name is for that reason repeated there.

Hawaiian Islands (Dana).

**Alpheus parvimanus** Kingsley.

*Alpheus parvimanus* Kingsley, Bulletin, etc., p. 195 (1877).

Panama! (F. H. Bradley, Yale College Museum).

**Alpheus sulcatus** Kingsley.

*Alpheus sulcatus* Kingsley, Bulletin, etc., p. 193 (1877).

Panama! Zorritas, Peru! (F. H. Bradley, Yale Museum).
This species has affinities with this section and hence is repeated.

§§ First and second joints of carpus of second pair of feet equal.

**Alpheus normannii** Kingsley.

*Alpheus affinis* Kingsley, Bulletin, etc., p. 195, 1871 (*nec* Guise).
*Alpheus normannii* Kingsley, Proc. Phil. Acad. 1878, p. 93.

Panama! (F. H. Bradley, Yale Museum).

**Alpheus packardii** Kingsley, Pl. II, fig. 2.

*Alpheus packardii* Kingsley, Proc. Phila. Acad. 1879, p. 417 (1880).

Key West, Fla.! (H. E. Webster, Union College Museum).

§§ First joint of carpus shorter than the second.

**Alpheus spinicaudus** Lockington.

*Alpheus spinicaudus* Lockington, Ann. and Mag. Nat. Hist. V, i, p. 476 (1878).

Gulf of California (Lockington).

** Larger hand notched above, entire below.

§ First carpal joint shorter than second.

### Alpheus pugnax Dana.

*Alpheus pugnax* Dana, Proc. Phila. Acad. vi, p. 23 (1852) Ex. Ex. Crust. p. 554, pl. XXXV, f. 6 (1852).

Hawaiian Islands (Dana).

§§ First and second carpal joints equal.

### Alpheus insignis Heller.

*Alpheus insignis* Heller, Verh. z. b. Ges. Wien xi, p. 26, 1861; Sitzungsber. k. k. Akad. Wien, xliv; p. 269, pl. III, f. 17–18 (1862).

Red Sea (Heller).

*** Both margins of larger cheliped entire.

§ First carpal joint larger than second.

### Alpheus fasciatus Lockington.

*Alpheus fasciatus* Lockington, Ann. and Mag. N. H., v, p. 478 (1878).

Gulf of California (Lockington).

### Alpheus diadema Dana. *Vide supra.*

§§ First and second carpal joint nearly equal.

### Alpheus novozelandiæ Miers.

*Alpheus novozelandiæ* Miers, Ann. and Mag. N. H. p. 82, pl. II, f. 2 (1876).

New Zealand (Miers).

§§§ First carpal joint shorter than the second.

### Alpheus ruber Milne Edwards.

*Cryptophthalmus ruber* Costa *op cit.*

*Alpheus ruber* M. Edw. Hist. Nat. de Crust. ii, p. 351 (1837); Régne Animal de Cuvier, III^e^ edition Crustace, pl. 53, fig. 1.

Mediterranean! (Phila. Acad.)

§§§§ No details of carpal joints.

### Alpheus crassimanus Heller.

*Alpheus crassimanus* Heller, Verh. z. b. Ges. Wien, p. 526 (1860).

Nicobars (Heller).

b. Basal joint of antennæ without an external spine.

*Dactylus working in a horizontal plane, at right angles to the usual one.

### Alpheus cylindricus Kingsley.

*Alpheus cylindricus* Kingsley, Bulletin, etc., iv, p. 196 (1877).

Panama! (F. H. Bradley, Yale Museum).

** Dactylus normal.

§ Both margins of larger cheliped constricted.

### Alpheus bisincisus De Haan.

*Alpheus bisincisus* De Haan, Fauna Japonica, Crustacea, pl. XLV, f. 3 (1849).

*Alpheus avaris* De Haan, *l. c.* p. 179 (1849).

*Alpheus strenuus* Dana, Proc. Phila. Acad. p. 21 (1852) U. S. Ex. Exped. Crust. p. 543, pl. XXXIV, f. 4 (1852).

Japan (De Haan), Tongatabu (Dana), Eastern Seas (Auct.).

### Alpheus lobidens De Haan.

*Alpheus lobidens* De Haan, F. Jap. Crust. p. 179 (1849).

Japan (De Haan).

### Alpheus Edwardsii Audouin.

*Alpheus Edwardsii* Audouin, Explication Planches de Savigny, Egypt, pl. X, fig. I (*teste Auct.*) Heller, Sitzungsber. K. Akad. Wien, xliv, i, p. 267 (1862).

*Alpheus neptunus* White, Zool. Ereb. and Terror, pl. iv, f. 3 (1874).

Red Sea (Heller), Mozambique (Bianconi), Port Essington, Australia (Miers).

### Alpheus heterochelis Say.

*Alpheus heterocheles* Say, Jour. Acad. Nat. Sci. Phila. i, p. 243 (1818); Kingsley, Bulletin, etc., iv, p. 194 (1877).

*Alpheus armillatus* Edw. Hist. Nat. Crust. ii, p. 354 (1837).

*Halopsyche lutaria* Saussure, Rev. et Mag. de Zoologie, 1857, p. 100.

*Alpheus bispinosus* Streets, Proc. Phila. Acad. 1872, p. 242.
*Alpheus lutarius* Saussure, Mem., Soc. Phys. et Hist. Nat. de Geneve, t. xiv, p. 461, pl, III, f. 24 (1858) [ext. p. 45].

From North Carolina! to Brazil, Rio Janeiro! West Indies! Panama! Realijo, Nicaragua! This form belongs to both coasts of tropical and sub-tropical America. Mr. Lockington (Ann. and Mag. Nat. Hist. V, i, p. 475, 1878) reports it from Lower California.

### Alpheus pacificus Dana.

*Alpheus pacificus* Dana, Proc. Phila. Acad. vi, p. 21 (1852) U. S. Expl. Exped. Crust. p. 544, pl. XXXIV, f. 5 (1852).

Hawaiian Is. (Dana).

### Alpheus japonicus Miers.

*Alpheus japonicus* Miers, Proc. Zool. Soey., London 1874, p. 53.

Japan (Miers).

### Alpheus spinicaudus Lockington.

*Alpheus spinicaudus* Lockington, Ann. and Mag. Nat. Hist. V, i, p. 476 (1878).

Lower California (Lockington).

### Alpheus jourdainii Guerin.

*Alpheus jourdainii* Guerin in De Sagra, Hist. Cuba, p. li (1837). [=? *A. sculptimanus.*]

No locality given.

### Alpheus sculptimanus Guerin.

*Alpheus sculptimanus* Guerin, l. c. p. li, 1837.

Janaon (Guerin).

### Alpheus laevigatus Guerin. Pl. II, fig. 3.

*Alpheus laevigatus* Guerin, Voy. Coquille Crust., p. 38.

### Alpheus strenuus.

*Alpheus strenuus* Dana, U. S. Ex. Ex. Crust. 543, xxxiv, f. 4 (1852).
*Alpheus doris* White, List Crust. Brit. Mus. 75, 1847, Crust. Erebus and Terror, pl. 4, f. 2 (1874).

*Alpheus rhode* White, l. c.

? *A. Avarus* Heller, Voy. Novara, Crust. p. 108 (1863).

Torres Straits, Sydney, Tongatabou, Philippines.

§§ Upper margin of larger chela notched, the lower entire.

### Alpheus brevirostris Edw.

*Alpheus brevirostris* (Edw.) (*ex* Olivier) Hist. Nat. d. Crust. ii, p. 350 (1837). New Holland.

### Alpheus kingsleyi Miers.

*Alpheus kingsleyi* Miers, P. Z. S. London, 1879, p. 54.

Japan (Miers).

### Alpheus rapax Fabr.

*Alpheus rapax* Fabricius, Suppl. Ent. Syst. p. 405, 1798, De Haan, op. cit. p. 177, pl. XLV, f. 2 (1849).

Japan (De Haan).

### Alpheus malabaricus Fabr.

*Alpheus malabaricus* Fabr., Suppl. f. 405 (1798) De Haan, op. cit. p. 177, Pl. XLV, f. 1 (1849).

*Alpheus brevicristatus* De Haan, l. c.

Japan (De Haan).

§§§ Both margins of the larger chela entire.

### Alpheus chiragricus Edw.

*Alpheus chiragricus* Edw., Hist. Nat. des Crustaces, p. "354" (1837).

Asiatic Seas (Edw.)

### Alpheus crinitus Dana.

*Alpheus crinitus* Dana, Proc. Phila. Acad. vi, p. 21 (1852) U. S. Ex. Exped. Crust. p. 548, pl. XXXIV, f. 8 (1852).

Balabac Straits (Dana).

### Alpheus obesomanus Dana.

*Alpheus obesomanus* Dana, Proc. Phila. Acad. vi, p. 21 (1852) U. S. Ex. Ex. Crust. p. 547, pl. XXXIV, f. 7 (1852).

Samoan Is.! (Phila. Acad.) Fiji Archipelago (Dana).

**Alpheus floridanus** Kingsley, Pl. II, fig. 8.

*Alpheus floridanus* Kingsley, Bulletin, U. S. Geol. Geog. Survey, iv, p. 193 (1877).

Fort Jefferson, Fla.! (Lieut. Jacques, Peabody Academy).

**Alpheus mitis** Dana.

*Alpheus mitis* Dana, Proc. Phila. Acad. vi, p. 22 (1852) Ex. Ex. Crust. p. 549, pl. XXXV, f. 1 (1852).

Balabac Straits (Dana).

**Alpheus paracrinitus** Miers.

*Alpheus paracrinitus* Miers, Ann. and Mag. Nat. Hist., Nov., 1881, p. 365.

Goree, Senegambia (Miers).

C. Front of carapax truncate, rostrum absent, orbital hoods without spiniform prolongation.

a. Hands normal.

**Alpheus frontalis** Edw.

*Alpheus frontalis* Edw., Hist. Nat. Crust. ii, p. 356 (1837). R. An. Cuv. pl. 53, fig 2.

New Holland (Edw.), Tahiti (Heller).

**Alpheus emarginatus** Edw.

*Alpheus emarginatus* Edw., Hist. Nat. Crust. ii, 357 (1837).

Locality unknown (Edw.).

**Alpheus pachychirus** Stm.

*Alpheus pachychirus* Stm. Proc. Phil. Acad., p. 30 (1860).

Loo Choo (Stm.).

**Alpheus simus** *Guerin.*

*Alpheus simus* Guerin, in De Sagra's Hist. Cuba, p. li, pl. 2, f. 11 (1857).

Cuba (Guerin).

**Alpheus affinis** *Guerin.*

*Alpheus affinis* Guerin, in De Sagra's Hist. Cuba, p. li (1857).

Bombay (Guerin).

### Alpheus sinuosus *Guerin.* Pl. II, fig. 6.

*Alpheus sinuosus* Guerin, in De Sagra, p. li (1857).

Callao, Chili! (Guerin, type in Philadelphia Academy).

b. Hands inverted.

### Alpheus longidactylus.

*Betœus longidactylus* Lockn. Proc. Cal. Acad., vii, p. 35 (1876).
*Alpheus longidactylus* Kingsley. Bull. U. S. Geol. Surv., iv, p. 198 (1877).

### Alpheus harfordi *Kingsley.* Pl. II, fig. 4.

*Alpheus lævigatus* Nicollet in C. Gay, Hist. Chili, Zool., iii, p. 215 (1849); *non* Guerin.
*Betœus equimanus* Lckn. Proc. Cal. Acad., vii, p. 43 (1876); *non* Dana.
*Alpheus harfordi* Kingsley. Bull. U. S. Geol. Surv., iv, p. 198 (1877).
*Alpheus equalis* Kingsley, l. c., p. 199 (1877).
*Betœus æqualis* Lckn. Ann. and Mag. N. H., V, i, p. 478 (1878).

### Alpheus australis *Kingsley.*

*Betœus australis* Stm. Proc. Phil. Acad., p. 31 (1860).
*Alpheus australis* Kingsley. Bull. U. S. Geol. Surv., iv, p. 190, 1877.

Port Jackson, Australia (Stm).

### Alpheus æquimanus *Kingsley.*

*Betœus æquimanus* Dana. U. S. Exp. Exped., Crust., p. 560, pl. XXV, f. 11, 1852.
*Alpheus equimanus* Kingsley. Bull. U. S. Geol. Surv., iv, p. 190 (1877).

### Alpheus candei *Guer.*

*Alpheus candei* Guer., in De Sagra's Hist. Cuba Zool., vii, p. pl. fig. (1857).
*Alpheus transversodactylus* Kingsley. Bull. U. S. Geol. Surv., iv, p. 196 (1877).

Santa Barbara! (W. G. W. Harford, Yale, Peab. Acad.); San Diego, Cal.! (Yale, Dr. E. Palmer); Bermudas! (J. M. Jones, Yale); Key West, Fla.! (H. E. Webster, Union College); Cuba! (Guerin, Phil. Acad.).

### Alpheus truncatus *Kingsley.*

*Betœus truncatus* Dana. U. S. Ex. Ex. Crust., p. 559, pl. xxxv, f. 5 (1852).

*Alpheus truncatus* Kingsley. Bulletin Geol. Surv., iv, p. 190 (1877).

Terra del Fuegia (Dana).

### Alpheus scabrodigitus *Kingsley.*

*Betœus scabrodigitus* Dana, l. c., p. 560, pl. xxv, f. 12 (1852).

Valparaiso (Dana).

The following species are either too imperfectly characterized to admit of recognition, or do not belong to the genus Alpheus as at present restricted.

**Alpheus aculeatus** *Sabine* = *Hippolyte grönlandica.*
**Alpheus amethysteus** *Risso* = *Anchistia amethystea.*
**Alpheus amphitrite** *White* MS.
**Alpheus avarus** *Fabr.*
**Alpheus caramote** *Risso* = *Peneus caramote.*
**Alpheus cougneti** *Risso* = *?Hippolyte sp.*
**Alpheus elegans** *Risso* = *Gnathophyllum elegans.*
**Alpheus elongatus** *Risso* = *Hippolyte sp.*
**Alpheus ensiferus** *Risso* = *Hippolyte sp.*
**Alpheus marmoratus** *Fabr.* = *Hippolyte marmoratus.*
**Alpheus monopodium** *Bosc.* = *Alpheus edwardsii.*
**Alpheus olivieri** *Risso* = *Hippolyte sp.*
**Alpheus polaris** *Sabine* = *Hippolyte polaris.*
**Alpheus punctulatus** *Risso* = *?.*
**Alpheus pelagicus** *Risso* = *?.*
**Alpheus scriptus** *Risso* = *Anchistia scripta.*
**Alpheus sivado** *Risso* = *Pasiphæ sivado.*
**Alpheus spinus** *Leach* = *Hippolyte spinus.*
**Alpheus tamulus** *Fabr.*
**Alpheus tyrrhenus** *Risso* = *Pontonia tyrrhena.*
**Alpheus viridis** *Otto* = *Hippolyte sp.*

Of the following species I can say nothing, as the descriptions are in works at present inaccessible to me.

### Alpheus galathea.

*Alpheus galathea* White. List B. M. Crust., p. 75 (1847), *sine descr.*; Miers Zool. Erebus and Terror, p. 5, pl. iv, f. 4 (1875).

Port Essington, Australia.

### Alpheus alope *White.*

*Alpheus alope* White. List B. M. Crustacea, p. 75, 1847 (*s. d.*); Miers Zool. Erebus and Terror, p. 5, pl. iv, f. 6 (1875).

Port Stephens, Australia.

### Alpheus costæ.

*Cryptophthalmus costæ*, Prestandrea. Nuovi annali d. sc. nat., 1838, p. 298 (*teste* Heller).

Mediterranean.

This is given by Heller (Crust. süd. Europa, p. 272, 1863) as a synonym of *A. lævimanus;* but whether it be that species or *A. ventricosus* or rather a distinct species I have not the means at hand to determine.

### Alpheus digitalis *De Haan.*

*Alpheus digitalis* De Haan. Fauna Japonica, p. 178, pl. xlv, f. 4.

Japan (De Haan).

### Alpheus forceps *White* MS.

### Alpheus latifrons *A. Milne Edwards.*

*Alpheus latifrons* A. Milne Edwards. Jour. Mus. Godeffroy, iv, p. 87, 1873.

Samoan Islands (A. M.-E.).

### Alpheus minor *De Haan.*

*Alpheus minor* De Haan, *op. cit.*, p. 180, pl. xlv, f. 6.

Japan (De Haan).

### Alpheus triton *White* MS.

### Alpheus lineifer *Miers.*

*Alpheus lineifer* Miers. Ann. and Mag. Nat. Hist., IV, xvi, p. 343, 1875.

Samoan Islands (Miers).

This species belongs either in the section with *Alpheus bisincisus* or in that which contains *A. parvirostris* and *A. spinicaudus;* but as no details are given regarding antennal spine and carpal joints, its affinities cannot be more closely indicated.

## Genus HIPPOLYTE Leach.

### Hippolyte prionota *Stimpson.* Pl. II, fig. 9.

Hippolyte prionota *Stimpson.* Proc. Phil. 1864, p. 153.

I figure this beautiful species from a specimen from Puget Sound, in the collection of the Philadelphia Academy.

## Genus CARIDINA Edw.

### Caridina africana *nov. sp.* Pl. I, fig. 3.

Carapax smooth, compressed; suborbital spine alone present; rostrum nearly as long as the carapax; its apex slightly reflexed and armed above and below with minute teeth. Peduncle of antennulæ about as long as the rostrum, its penult and last joints subequal. Antennal scale slightly longer than antennular peduncle, its apex regularly ovate, its sides parallel, no spine on the basal joint. Ambulatory feet very slender, short, the carpus of the first pair about as long as the palm, of the second as long as the handfingers of both terminated by pencils of short hairs. Dactyli of three posterior pairs of feet slightly curved, simple and about one-fifth the length of the propodal joints. Telson narrow, the sides straight and but slightly converging to the truncate tip which falls a little short of the narrow caudal lamellæ of the sixth segment.

Zulu Mission, South Africa (S. A. Grout).

## Genus XIPHOCARIS Martens.

In my revision of the genera of Palæmonidæ (Proc. Acad. Nat. Sci. Phila., 1879, p. 426), I referred the single species of this genus to *Caulurus* of Stimpson; but having since seen specimens, I have

found that its affinities are not with the Palæmonidæ, but rather with *Atya* and *Caradina*, as it possesses the mandibles characteristic of that group.

### Genus **HIPPOLYSMATA** Stimpson.

**Hippolysmata wurdmanni** *Stimpson.* Pl. I, fig. 8.

**Hippolysmata intermedia** *Kingsley.* Pl. I, fig. 4.

I give figures of some details of these two species to aid in their identification.

### Genus **NECTOCRANGON** Brandt.

**N. alaskensis** *nov.*

Carapax but little depressed, with four prominent equally spaced teeth in the median line, the anterior one forming the rostrum, and with a fifth smaller tooth between the first and second. A strong spine on each hepatic region. Front strongly elevated, the orbits elongate, tubular, and each with two spiniform teeth above. Pterygostomian spine very prominent. Peduncle of antennulæ barely reaching to middle of the antennal scale, and the flagella not reaching its tip, otherwise both pairs of antennæ are much as in *N. lar.* The external maxilipeds and thoracic feet present no important differences from *N. lar.* The sterna of the three last thoracic segments bear large prominent spines. The abdomen has a median dorsal carina, which on the sixth segment and telson is double as in the previously described species. Length about one and one-half inches.

Marmot Island, Kodiac Archipelago, Alaska (Dr. W. H. Jones, Philadelphia Academy).

### Genus **CRANGON** Fabricius.

**Crangon tenuifrons** *nov.* Pl. I, fig. 10.

Carapax depressed, its surface uneven, with two spines in the median line above, of which the posterior is just behind the middle and the smaller, anterior one at the base of the rostrum. Rostrum elevated, arcuate, somewhat elongated, and reminding one of that of *Sabinea septemcarinata.* Subocular, pterygostomian, and hepatic spines prominent. Antennulæ with a broad basal scale, the peduncle extending nearly to the middle of the antennal scale. Two flagella present, the outer thicker one reaching the tip of the antennal scale,

the inner extending a little farther. Antennal scale narrow, elongate, flagellum two-thirds as long as the body. External maxillipeds with the distal joints hairy, and exceeding by half their length the antennal scales. First pair of feet much as in *C. vulgaris*, the carpus with a spine on each side below. The occludent margin of the hand very oblique. Second and third pairs of feet slender, the second chelate and a little shorter than the third; fourth and fifth pairs elongate cylindrical, the dactyli styliform. First five joints of the abdomen with a median carina, the sixth and telson with two carinal telson elongate, sides straight, tip acute.

Length two inches.

Marmot Island, Kodiac Archipelago, Alaska (Dr. W. H. Jones, Phila. Acad.).

I insert for comparison figures of *C. vulgaris* (pl. I, fig. 5), *C. boreas* (pl. I, fig. 6), and *C. franciscorum* (pl. I, fig. 7).

### Crangon vulgaris *Fabr.* Pl. I, fig. 5.

I have examined numerous specimens of this species from the east and west coasts of America and from Europe, and fully agree with Professor Smith in uniting with it the form formerly known as *C. nigricauda*. Specimens in the Peabody Academy from Beverly, Mass. (No. 138) have the sixth and seventh abdominal segments sulcate above as in the majority of the west coast forms. Kinahan's figures (Proc. Roy. Irish Acad., viii, pl. iv, 1864) are very incorrect. The second pair of feet are greatly larger than in any specimens I have seen, and the joints of the external maxillipeds are wholly unlike those found in nature.

### Crangon salebrosus *Owen.*

This is probably to be found in North American waters; there are specimens in the museum of the Philadelphia Academy without locality, but which came with other American forms (*Paracrangon echinatus*, *Hippolyte prionota*, etc.). Its original locality, Kamtschatka, would seem to favor this idea.

### Crangon batei.

*Crangon intermedius* Bate. Proc. Zoöl. Soc'y, London, 1863, p. 503, pl. XLI, f. 6. Haswell Cat. Australian Crust., 181 (1882), desc. compiled.

This Australian species must be renamed, the term *intermedius* having been used in 1860 by Stimpson for a species from Behrings Straits. Mr. Bate is rather unfortunate with the species described in this paper,

for with the exception of this and one other species, every form is assigned to a wrong genus. The genus *Angasia* is, as I have previously shown, synonymous with the earlier *Tozeuma* of Stimpson.

### Evaxius tricarinatus *n. g. et n. s.* Pl. I, fig. 1.

A single imperfect specimen, lacking both chelipeds, forms the basis of this description. I should hesitate to describe it were its other characters so well marked as to render it a very distinct and interesting form.

Cephalothorax small, compressed; abdomen large and somewhat depressed. Body everywhere with a sparse pubescence, among which are interspersed larger hairs. Carapax with a median dorsal carina extending from the "cervical suture"[3] as far as the eyes and terminating anteriorly by a sharp tooth; just behind this tooth occurs a broad and shallow emargination. On either side of this median carina is found a less conspicuous one extending from above the eyes half way back to the "cervical suture;" its anterior extremity likewise terminating in a tooth similar to that of the median carina. In front of these carinæ the carapax is strongly deflexed and terminates anteriorly in a small triangular rostrum extending about half its length, beyond the eyes. The anterior and inferior margins of the carapax are smooth and unarmed. The basal joints of the antennulæ are hairy, the two distal ones being subequal. Flagella two, of equal length, but the inner of smaller diameter; no spines or scales on the basal joints. Antenna without a basal scale, the penult joint compressed and over twice the length of the last joint; flagellum a little longer than the carapax. External maxillipeds pediform, flattened and extending to the extremity of the antennal peduncle. In the specimen the first pair of pereiopoda had been broken off during life, but were in process of restoration; the chelæ were didactyle, the fingers being equal. Second pair of walking feet compressed; carpus and propodus subequal; the chelæ well formed. Third and fourth pairs also compressed, monodactyle, the propodus pectinate and bristled beneath. Fifth pair smaller, subchelate. Pleopoda small and inconspicuous. Lower margins of abdominal segments rounded. Caudal lamellæ broad with rounded extremities, each with a median

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[3]This suture does *not* indicate the line of division between the head and thorax as is usually stated. Those who may be interested will find a masterly exposition of the meaning and significance of this line in the portions on the morphology of the Crustacea with which Professor Dana begins his splendid work on the Crustacea of the U. S. Exploring Expedition.

carina on the dorsal surface. Telson broad and rounded, ecarinate, pubescent above, extremity rounded. Length one and one-half inches.

The single specimen which is in the Museum of the Boston Society of Natural History was brought from Zanzibar by Dr. Charles Pickering.

This form clearly belongs to the Gebidæ as limited by Dana, but it is clearly separated from all known genera by well marked characters: from *Gebia* and its allies by the absence of the antennal scale and the chelate second pair of pereiopoda; from *Axius* in the absence of the antennal scale and from *Gebiopsis* A. Milne-Edwards, by the characters of the second pair of walking feet. Its position seems to be intermediate between *Axius* and *Gebiopsis.*

### Nephrops occidentalis *Randall.* Pl. II, fig. 1.

*Nephrops occidentalis Randall.* Jour. Phila. Acad., viii, p. 1839 [1840].

When at work at the collections of the Philadelphia Academy, I was unsuccessful in my search for the type of this species, which was supposed to have been brought from the west coast of America. In the collection which formed the basis of Dr. Randall's paper, there were specimens from California and from the Sandwich Islands, and it is possible that some transfer of labels took place here as well as in the case of one of the *grapsidæ.* This supposition is rendered the more probable from the fact that this species has never been reported from our shores, except by Randall, and so far as I am aware, it has never been seen by carcinologists since his day. In going over the collections of the Boston Society, I found, however, three imperfect specimens from Mauai, Hawaiian Islands, presented by Dr. Winslow, which agree well with Dr. Randall's description, and one of which furnished the illustration accompanying the present article. It is a valid member of the genus, and can readily be identified by the figure and description.

## EXPLANATION OF PLATES.

### PLATE I.

FIG.

1 *Evaxius tricarinatus.*

2 *Leander hammondi; a*, antennula; *b*, carapax; *c*, second thoracic foot.

3 *Caradina africana; a*, second thoracic foot.

4 *Hippolysmata intermedia.*

5 *Crangon vulgaris; a*, mandible; *b*, chela; *c*, antennal scale.

6 *Crangon boreas;* with chela, mandible and antennal scale.

7 *Crangon franciscorum* and chela.

8 *Hippolysmata wurdemanni* and mandible.

9 Antennal scale of *Crangon vulgaris* (the form described as *nigricauda*).

10 *Crangon tenuifrons.*

### PLATE II.

FIG.

1 *Nephrops occidentalis.*

2 *Alpheus packardii.*

3 *Alpheus lævigatus; a*, second thoracic foot.

4 Chela of *Alpheus harfordi; a*, anterior portion of carapax, etc.

5 *Alpheus websteri.*

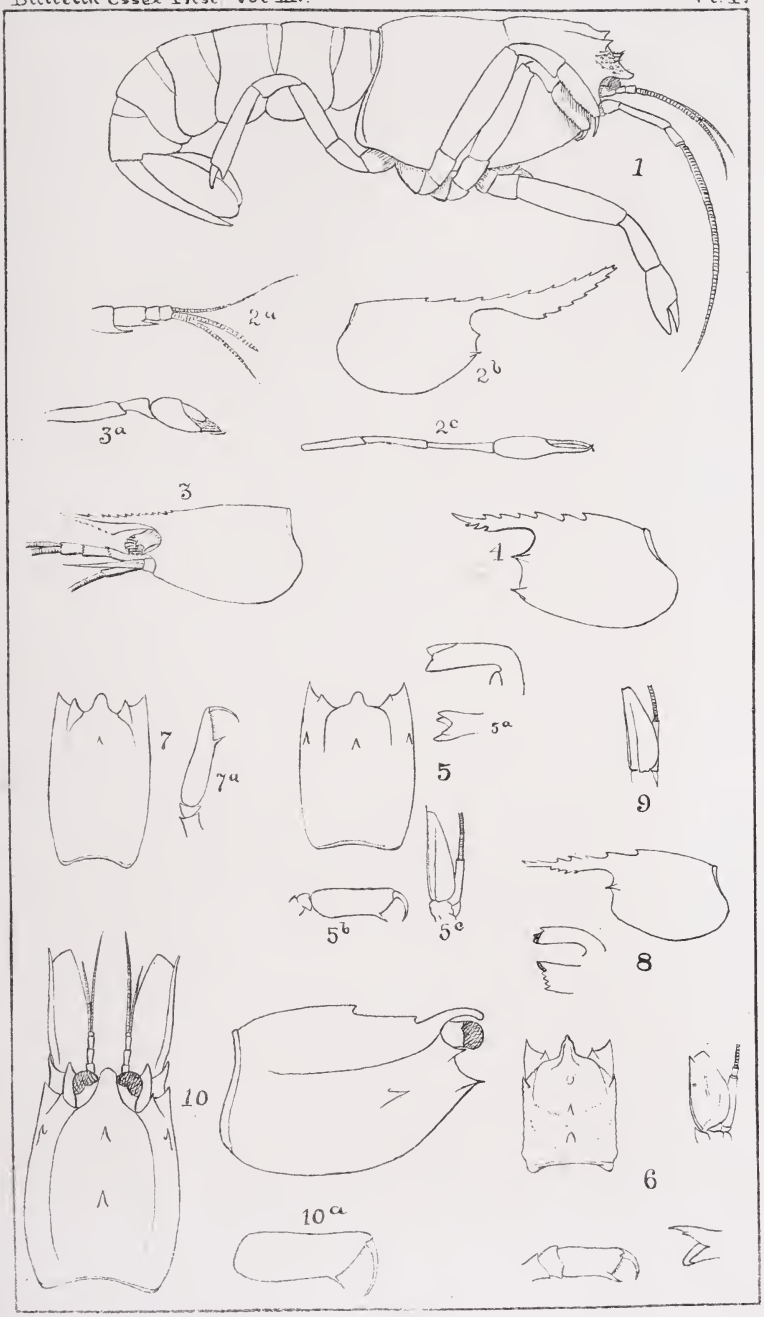
6 *Alpheus sinuosus.*

7 *Alpheus thetis.*

8 *Alpheus floridanus.*

9 *Hippolyte prionota.*

10 Rostrum and *a*, antennula of *Anchistia americana.*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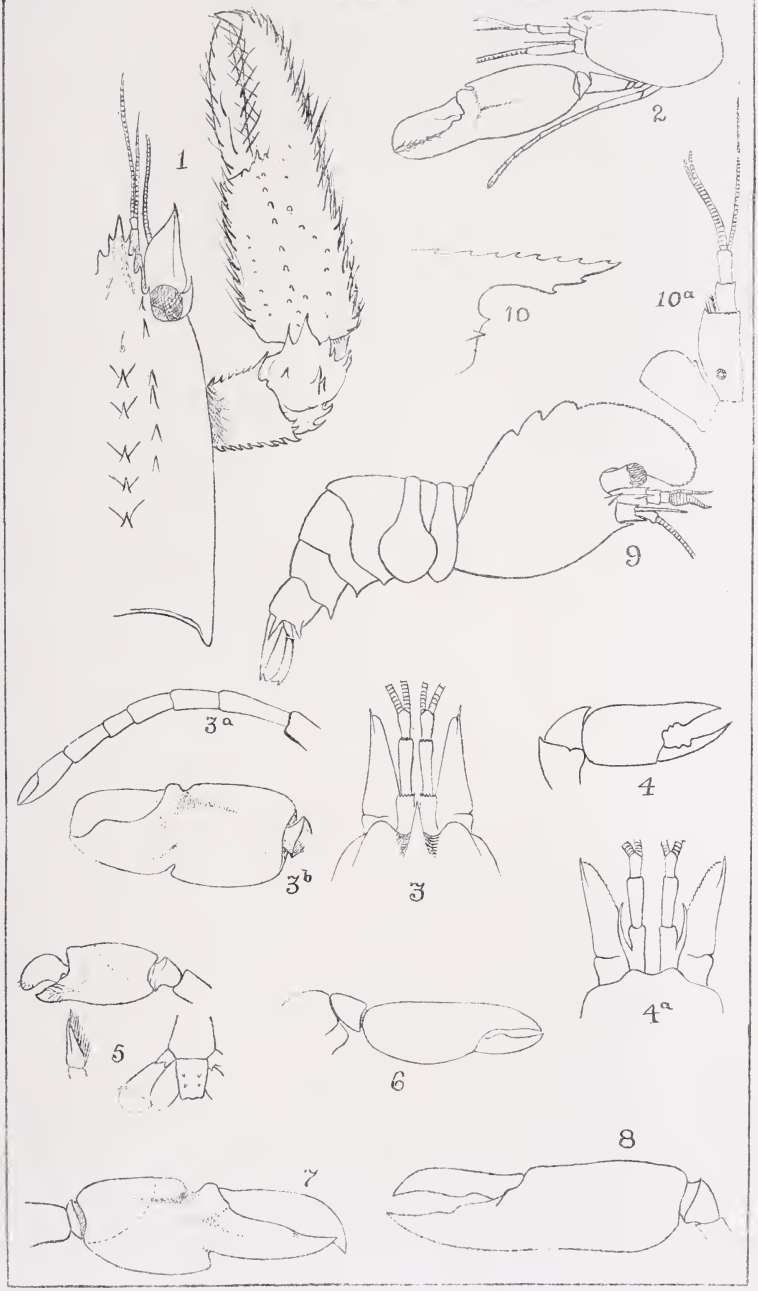
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# POPULAR ERRORS REGARDING THE DURATION OF LIFE.

*A paper read before the Essex Institute, Oct. 9,* 1882.

BY ADONIRAM C. ORNE.

THERE is probably no subject on which so much has been written, so much labor bestowed, which is so little understood as the duration of life. The popular idea is that a generation passes away in about thirty-three years.

I shall endeavor to show that this is a very great mistake and arises from a misapprehension of the facts in the case. I propose to show that we live much longer, and to point out where statisticians make their mistakes.

It is universally admitted that not exceeding two per cent of the entire population die annually. This fact being admitted, it follows logically that, if two per cent die in one year, it will require fifty years for the whole population to die; and if it requires fifty years for a generation to pass away, this establishes the fact that the average life of a generation is fifty years instead of thirty-three as is generally supposed.

The mistake arises from the fact that in making up their calculations statisticians do not take into consideration the difference between the average age at death and the average duration of life. For example, suppose you want to get the duration of life of one thousand children, you must first ascertain the age at death of the entire thousand which cannot be done until all have passed away.

The mistake arises with our statisticians from the fact that they attempt to give it before half have died. They base their calculations upon the number of deaths without taking into consideration the increase of population aris-

ing from the excess of births over deaths, and from immigration. In our registration report of 1875 it is said "In these thirty-five years, a period within which an entire generation of mankind has passed through its stages of infancy, maturity, and decay, the registration officers of Massachusetts have recorded the facts concerning 761,428 deaths within the borders of the State."

After reading the report I called on the author and put this question to him: "How did you succeed in getting rid of a generation in thirty-five years, when but two per cent a year of deaths have taken place for the last thirty-five years?" His reply was: "According to latest authorities the length of a generation was thirty-four years; and as the population of 1840 was 737,700 and as 761,428 deaths occurred in the thirty-five years which was 23,728 more than the population of 1840, this would favour the idea of a generation passing away in thirty-four years." Now, if the population of the state had remained stationary for the thirty-five years this calculation would have been correct, but unfortunately for his calculation that was not the case. The population of the state in 1840 was 737,700; in 1875 it was 1,651,912, making a gain in thirty-five years of 890,484 which was 152,784 more than the population of 1840, with all the deaths taken out. He should have found what the average population for the thirty-five years was, which was 1,210,277, and this would give fifty-five years for a generation to pass away. The first attempt to prove by statistics that a generation passes away in thirty-five years was a complete failure. The increase of population is greater than the deaths for eleven, thirty-five or one hundred years, taking the population of 1875, and is a larger number than the deaths for the previous hundred years. Massachusetts Registration Reports demonstrate that the deaths under five years for eleven, thirty-five or one hundred years, do not amount

to more than eighteen per cent if we take into the account the number living from which the deaths under five years have been taken. In Massachusetts, of all the population, there are twice as many that live to be seventy as die under five. In the City of Salem there were living in the year 1875 a number of persons between seventy and eighty years of age equal to thirty-two per cent of all births that occurred from seventy to eighty years previous. In the State of Massachusetts there were, between seventy and eighty years of age, thirty-eight per cent of the number that were born seventy and eighty years previous to the year 1875. From this fact we learn, as well as from all the census reports, both state and national, that thirty-eight per cent of all the population of the state live to be seventy years and upwards. There is not a single life-table that gives anywhere near the correct number who die under five, and who live to be seventy and upwards. The true duration of life of the different countries of the world is as follows:

| | yrs. | mos. |
|---|---|---|
| England and Wales, | 45 | 5 |
| Russia, | 37 | 8 |
| Austria, | 32 | 6 |
| France, | 42 | 3 |
| Hungary, | 25 | 1 |
| Switzerland, | 41 | 8 |
| Italy, | 33 | 5 |
| Spain, | 33 | 8 |
| German Empire, | 37 | 0 |
| The Netherlands, | 40 | 5 |
| Massachusetts, | 50 | 4 |
| Denmark, | 50 | 4 |
| Sweden, | 51 | 0 |

It will be seen by the above that the English life-tables fall short of the actual duration of life, according to the

Carlisle table, seven years; according to the English life-table, five years; while what we call the American life-table falls short twenty-two years. I am satisfied that the Wigglesworth table is founded on the same principle as the English tables, but the increase of population is so much greater in Massachusetts than in England that in Massachusetts, if we go back to the year 1800, we have to multiply by four to get the population of 1880; while in England if we go back to 1800, to get the population of 1880, we have to multiply by two only. In getting the number who live to seventy and upwards we go back from seventy to one hundred years. The population of the state at that time was very small. Massachusetts was in her infancy. Massachusetts should have a life-table based on the vital statistics of Massachusetts. We spend money enough every year to have one. It is a disgrace to the state to have such a table as Wigglesworth's which has the sanction of the Supreme Court of Massachusetts, and is used by them and by other courts of the country in ascertaining the value of life estates, widows' dowers, annuities, etc. Of the 700,167 added to the state from 1865 to 1875, eleven years, there were 315,286 deaths; there were 113,424 under five years of age, which was thirty-six per cent; 43,413 that lived to be seventy and upwards. These deaths under five were taken from a birth rate of thirty-nine thousand per year. The number that lived to be seventy and upwards were taken from a birth rate of ten thousand per year. To the 700,167 added to the state we stop adding any more births; we take the years 1876, '77, '78, '79. After we find the number of deaths under five years for the four years, we add them to the 113,424, which makes 123,260; this number is all the deaths under five of the 700,167, which makes seventeen and two-thirds per cent. A num-

ber equal to thirty-eight per cent will be alive in seventy years from their birth; so, to find the average duration of life in Massachusetts, we find that seventeen and two-thirds per cent die under five years of age, thirty-eight per cent live to be seventy and upwards.

| | Under 5 years per cent. | 70 yrs. & upwards per cent. | 5 to 70 years per cent. |
|---|---|---|---|
| Carlisle table . . . | 32 | 24 | 44 |
| Wigglesworth . . . | 39 | 14 | 47 |
| English life-table . . | 25 | 25 | 50 |
| Mass. average-at-death table . . . | 36 | 14 | 50 |
| Mass. average-duration-of-life table . | 18 | 38 | 44 |

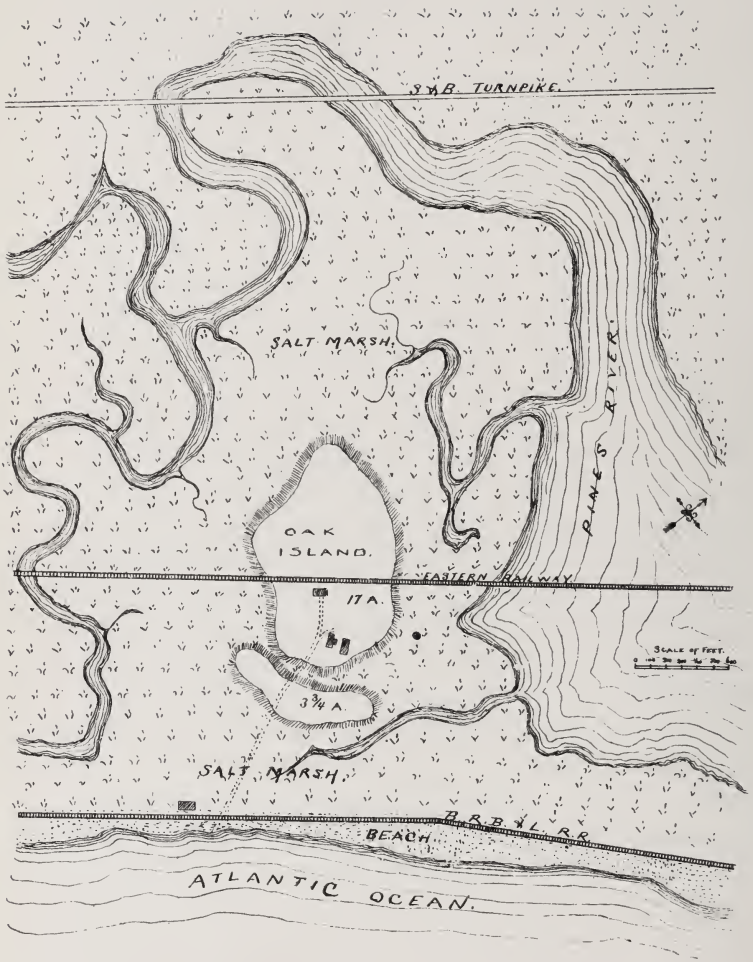
In the town of Munroe, in Franklin county, in the year 1875, there was one death, a child two years old; and the report for that year makes the average age at death two years. As the population of Munroe was one hundred and ninety, and the death rate one per year, it would take one hundred and ninety years for a generation to pass away. Now, suppose the oldest person in that town had died, who was eighty years of age, the report would have been that the average age at death was eighty years, and as only one death occurred the length of a generation would be one hundred and ninety years. Massachusetts has expended a very large amount of money to ascertain the average age at death of all persons whose death takes place within the state, and we have tables showing the average age at death in every town and city of the state, and this average age at death is mistaken for the average duration of life. There is a difference of twenty years between them. It is these tables that have given the impression that the length of a generation is thirty years in Massachusetts. They are very deceptive and of little use. When such a man as Carrol D. Wright is deceived by such statistics, they can be of little use to the common

reader. In his report on the census of Massachusetts, he says "while from the Massachusetts Registration Reports it is learned that the average age to which all live is about thirty," he comes within twenty years of the right figure. The most important fact and the easiest obtained is to get the number of the population and the number of deaths. For the City of Salem the deaths for the eleven years, from 1865 to 1875, were 54.07, the population 25,958 or 1.89 : to 100 living; if we take the average of the population for the eleven years it is a trifle over two per cent, which would take forty-nine years as the length of a generation in this city.

Holyoke is considered the most unhealthy city in Massachusetts : the deaths under five years are fifty-two per cent of all the deaths in the city. This is calculated on the births which for the eleven years were 4,065. There were added to the city by immigration during the eleven years, 10,612, of which number sixteen and one-half per cent were under five years of age, which makes 1,750 added to the city by immigration, making with the births, which were 4,065, 5,815 to draw the deaths under five from. Now, if 5,815 gives fifty-two per cent deaths under five years, what will 4,065 give? answer, thirty-six per cent, just the average of the whole state. There were added to the state by immigration in the eleven years, 273,044, of this number 255,992 were added in cities. Of this 255,992, there were added to the cities 42,238 under five years of age in the eleven years; that is what makes the deaths under five greater in the cities, 42,238 being distributed in the different cities according to the increase of population; this number is in addition to the births of the cities. Our registration officers have left out entirely the number under five that have been added to the state by immigration, and many blunders

have taken place in consequence. Should the city of Salem have gained in population as large a percentage as Holyoke did, the city would have had as large a death rate under five as Holyoke had, and would have been called the most unhealthy city in the state, and the State Board of Health would have had a special report on your city, with a map showing the causes of the great death rate under five years, as they did of Holyoke. They had three maps of Holyoke, and after a thorough investigation they report: "As far as situation and surroundings are concerned, Holyoke should be a healthy place," and Holyoke is a healthy place, and the death rate is no greater than the average of Massachusetts. The mistake is in our registration officers and State Board of Health. They leave out of the calculation the increase of population. Holyoke, in 1865, a town of 5,648, becomes a city in 1875, of 16,260, having added to her population 10,612 in the eleven years. The children under five years of this 10,612 are left out of the count, the number being 1,750. With this 1,750 left out, the deaths under five are 52 per cent; with the number added, thirty-six per cent, which makes Holyoke as healthy as the state averages. So of the other cities of the state; they are considered unhealthy just in proportion to the percentage of the increase of population. The greater the increase of population the greater the death rate under five will be. Holyoke is very much annoyed by these reports. People coming there to settle, the first question they ask is, "Is Holyoke a healthy city?" and it is a healthy city, and the citizens say it is healthy. They are met with the remark that it is the most unhealthy place in the state, and the report of our registration officers and State Board of health are given as authority. These reports based on ignorance are doing a great amount of mischief. Suppose

Salem had as great an increase of population as Holyoke, you would have had as large a death rate under five as Holyoke. The State Board of Health would have had a map of your city and with the Mill Pond nuisance and the North River, and you could not have made people believe that your death rate under five was due to any other cause than the two causes named. A great deal of mischief results from not understanding the causes of the great death rate in certain localities. A great amount of labor has been expended to show that our cities have a much larger death rate under five than the country towns. I fail to see it. I see where our state officials make their mistake. They have left out of their calculation the number under five added to the state by immigration, nearly all of which goes to the cities, and the cities that draw the largest percentage are considered the most unhealthy. Had this immigration gone to the country towns instead of the cities, what would our registration officers and Board of Health have said was the cause of the deaths under five years being greater in the country towns than in the cities, as they surely would have been had immigration gone to the country towns instead of the cities? I imagine they would have said the cities have pure water, their sanitary conditions are better regulated, they are under better police regulations, and the cities draw the most able physicians in the state. There is no reason why the cities of the state should not be as healthy as the rest of the state and they are.

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# CATALOGUE OF THE FLORA OF "OAK ISLAND," REVERE, MASSACHUSETTS: WITH NOTES.

By Herbert A. Young.

## INTRODUCTION AND SUMMARY.

By John Robinson.

"Oak Island," or "Chelsea Beach Island," as it was called before North Chelsea was rechristened Revere, is a slight elevation of land, covered with trees, hardly reaching more than three or four feet above the surrounding saltmarsh, within the limits of the town of Revere, Massachusetts, and just a few rods beyond the inlet which separates that town from the town of Saugus in Essex County.

The island begins at about 800 feet back from what is now called Revere beach, with a strip of land running north and south 1,000 feet, having a breadth of 100 feet which is connected with the larger portion of the island which runs east and west some 1,400 feet, and has a breadth of 800 feet. This latter portion is divided into two unequal parts by the Eastern Railway which runs through it north and south. The Salem and Boston turnpike road runs by the island to the west at a distance of about a quarter of a mile. Formerly this station was only accessible to pedestrians and to the salt hay teams by a rough road from the beach.

Recently, however, with the opening of Revere beach as a pleasure resort, a picnic ground with its accompany-

ing dance stands and "flying horses" has been established on the easterly portion of the larger section of the island, and not only is the pleasant seclusion of the place interfered with, but at no distant day this interesting and historic botanical station will become for botanists a memory of the past. Mr. Young observes that the smaller detached portion of the island is more elevated and dryer than the larger portion, and that it possesses a somewhat different flora.

The wood upon the island has been cut from time to time, the last general cutting having been made perhaps not long after the Eastern Railway was built in 1837. The growth of timber now on the island is of deciduous-leaved trees, and consists chiefly of oaks, basswood, hickory and sassafras, the only coniferous tree being the red cedar (*Juniperus Virginiana*) which is represented by a few scattered specimens.

The soil is a vegetable humus on sand and gravel, upon which the plants thrive in moist seasons with great luxuriance.

The island is also a favorable locality for the collection of land snails and has been well known to botanists and conchologists for many years.

The whole number of plants noted in Mr. Young's list which includes the phanerogams, ferns and mosses, is three hundred and sixty-two, divided among the different families as follows :

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Note.—Mr. C. E. Faxon and Geo. E. Davenport have kindly looked over Mr. Young's list and the collection of specimens which he has preserved, and add the following as the only species which they have noticed on or near the island not included. Ranunculus Cymbalaria, *Pursh;* Ranunculus sceleratus, *L.;* Sagina procumbens, *L.* Along the railroad track between Revere station and Oak Island near the last bridge (G. E. D.). Cynoglossum Morisoni, *DC.* On the island (C. E. F.).

| | Gen. | Sp. | Int. |
|---|---|---|---|
| Ranunculaceæ. | 4 | 10 | 2 |
| Berberidaceæ. | 1 | 1 | 1 |
| Cruciferæ. | 7 | 9 | 3 |
| Violaceæ. | 1 | 3 | |
| Cistaceæ. | 2 | 2 | |
| Hypericaceæ. | 1 | 3 | 1 |
| Caryophyllaceæ. | 8 | 11 | 5 |
| Portulacaceæ. | 1 | 1 | 1 |
| Tiliaceæ. | 1 | 1 | |
| Geraniaceæ. | 3 | 3 | |
| Anacardiaceæ. | 1 | 3 | |
| Vitaceæ. | 2 | 2 | |
| Celastraceæ. | 1 | 1 | |
| Leguminosæ. | 7 | 14 | 5 |
| Rosaceæ. | 10 | 18 | |
| Saxifragaceæ. | 1 | 2 | |
| Hamamelaceæ. | 1 | 1 | |
| Onagraceæ. | 3 | 5 | |
| Lythraceæ. | 1 | 1 | |
| Umbelliferæ. | 5 | 5 | 1 |
| Araliaceæ. | 1 | 1 | |
| Cornaceæ. | 1 | 1 | |
| Caprifoliaceæ. | 4 | 4 | |
| Rubiaceæ. | 2 | 4 | |
| Compositæ. | 23 | 48 | 4 |
| Campanulaceæ. | 1 | 1 | |
| Ericaceæ. | 4 | 6 | |
| Aquifoliaceæ. | 1 | 1 | |
| Plantaginaceæ. | 1 | 3 | 1 |
| Plumbaginaceæ. | 1 | 1 | |
| Primulaceæ. | 1 | 2 | |
| Orolanchaceæ. | 2 | 2 | |
| Scrophulariaceæ. | 6 | 10 | 2 |
| Verbenaceæ. | 2 | 2 | |
| | 111 | 182 | 26 |

| | Gen. | Sp. | Int. |
|---|---|---|---|
| | 111 | 182 | 26 |
| Labiatæ. | 8 | 8 | |
| Convolvulaceæ. | 1 | 1 | |
| Solanaceæ. | 1 | 1 | 1 |
| Gentianaceæ. | 1 | 1 | |
| Apocynaceæ. | 1 | 1 | |
| Asclepiadaceæ. | 1 | 2 | |
| Chenopodiaceæ. | 5 | 7 | 2 |
| Amarantaceæ. | 1 | 2 | 2 |
| Polygonaceæ. | 2 | 10 | 4 |
| Lauraceæ. | 1 | 1 | |
| Euphorbiaceæ. | 2 | 3 | |
| Urticaceæ. | 2 | 2 | |
| Cupuliferæ. | 3 | 10 | |
| Myricaceæ. | 1 | 1 | |
| Betulaceæ. | 1 | 1 | |
| Salicaceæ. | 2 | 4 | |
| Coniferæ. | 1 | 1 | |
| Araceæ. | 1 | 1 | |
| Naiadaceæ. | 1 | 1 | |
| Alismaceæ. | 1 | 1 | |
| Orchidaceæ. | 1 | 1 | |
| Iridaceæ. | 2 | 2 | |
| Smilaceæ. | 1 | 2 | |
| Liliaceæ. | 8 | 10 | 1 |
| Juncaceæ. | 2 | 6 | |
| Cyperaceæ. | 5 | 24 | |
| Gramineæ. | 22 | 44 | 9 |
| Equisetaceæ. | 1 | 1 | |
| Filices. | 4 | 4 | |
| Ophioglossaceæ. | 1 | 1 | |
| Musci. | 16 | 25 | |
| Hepaticæ. | 3 | 3 | |
| | 213 | 364 | 45 |

| | Ord. | Gen. | Sp. | Int. |
|---|---|---|---|---|
| Exogens. | 50 | 144 | 237 | 35 |
| Gymnosperms. | 1 | 1 | 1 | |
| Endogens. | 10 | 44 | 92 | 10 |
| Vascular Cryptogams. | 3 | 6 | 6 | |
| Muscineæ. | 2 | 19 | 28 | |
| | 66 | 214 | 364 | 45 |

# THE FLORA OF OAK ISLAND.

BY HERBERT A. YOUNG.

The species enumerated in the following list were mostly observed during the year 1882, although the writer has been familiar with the station for many seasons previous. Representatives of nearly all the species have been preserved. As the list is therefore based upon the work of a season rather unfavorable for botanical collecting, on account of the drought of July and August, it is probable that other species might be added especially to the list of mosses which owing to their small size are easily overlooked.

The region was evidently familiar to Dr. Bigelow, for in the "Florula Bostoniensis" he mentions the following species as found on "Chelsea Beach Island:"

Ranunculus recurvatus, *Poir.*
Arabis falcata, *Michx.*
Cryptotænia Canadensis, *D C.*
Osmorrhiza longistylis, *D C.*
Circæa lutitiana, *L.*
Desmodium cuspidatum, *Torrey.*
Monarda allophylla, *Michx.*
Phryma leptostachia, *L.*
Scrophularia Marilandica, *L.*
Lysimachia ciliata, *L.*
Allium Canadense, *L.*
Leersia Virginica, *Willd.*
Botrychium Virginicum, *Willd.*

With the exception of Phryma all have been collected during the past season. The portion of the island to the

east of the tracks of the Eastern Railway has for several years been used for the purposes of a picnic ground, so that the herbs and undershrubs are fast disappearing, and can only now be collected in the spots along the outskirts, and in a few years the farther portion of the island to the west of the Eastern Railway will undoubtedly share the same fate, thus entirely destroying one of the most interesting botanical stations in this part of the country.

**Ranunculaceæ.**

Anemone Virginiana, *L.* A few specimens found.
Anemone nemorosa, *L.* Abundant.
Thalictrum dioicum, *L.* Abundant.
Thalictrum purpurascens, *L.* Abundant. Matures a short time after T. dioicum and before T. Cornuti. Recognized first by the peculiar odor of the leaves.
Thalictrum Cornuti, *L.* Abundant.
Ranunculus recurvatus, *Poir.* Not very abundant.
Ranunculus abortivus, *L.* Abundant.
Ranunculus bulbosus, *L.* One specimen only obtained.
Ranunculus acris, *L.* Only a few specimens noticed.
Actuæ spicata, *L.* var. rubra, *Michx.* Abundant.

**Berberidaceæ.**

Berberis vulgaris, *L.* One bush in the western part.

**Cruciferæ.**

Cardamine hirsuta, L., var. sylvatica. Scarce.
Arabis Canadensis, *L.* Abundant in the western part.
Arabis perfoliata, *Lam.* A few specimens noticed in 1878.
Sisymbrium officinale, *Scop.* Abundant near the barn.
Capsella Bursa-pastoris, *Mœnch.* Near house and barn.
Lepidium Virginicum, *L.* Mostly on the road from the beach to the island.
Lepidium ruderale, *L.* Mostly on the road from the beach to the island.
Cakile Americana, *Nutt.* Around the edges.
Raphanus Raphanistrum, *L.* One specimen only.

**Violaceæ.**

Viola cucullata, *Ait.* Specimens abundant and very large.
Viola sagittata, *Ait.* A few small specimens only found.

Viola pubescens, *Ait.* Quite abundant in the western part: growing scarcer.

**Cistaceæ.**

Helianthemum Canadense, *Michx.* Found in extreme eastern part.

Lechea major, *Michx.* Found in the extreme eastern part.

**Hypericaceæ.**

Hypericum perforatum, *L.* Quite abundant.

Hypericum corymbosum, *Muhl.* Found in the western part.

Hypericum mutilum, *L.* Scarce. Found near railroad track.

**Caryophyllaceæ.**

Dianthus Armeria, *L.* A few specimens obtained.

Silene inflata, *Smith.* Abundant near railroad track.

Silene antirrhina, *L.* Abundant near railroad track.

Arenaria lateriflora, *L.* Abundant.

Stellaria media, *Smith.* Abundant.

Cerastium viscosum, *L.* Abundant.

Lepigonum rubrum, *Fries.*, var. campestre. Only one specimen found.

Lepigonum medium, *Fries.* Common in the western part along the edge bordering on the salt marsh.

Lepigonum salinum, *Fries.* Abundant. Growing with L. medium.

Scleranthus annuus, *L.* Scarce. On the railroad track.

Mollugo verticillata, *L.* On the railroad embankment.

**Portulacaceæ.**

Portulaca oleracea, *L.* On the railroad embankment.

**Tiliaceæ.**

Tilia Americana, *L.* The most abundant tree.

**Geraniaceæ.**

Geranium maculatum, *L.* Abundant.

Impatiens fulva, *Nutt.* The form producing without flowering most abundant.

Oxalis stricta, *L.* Abundant.

**Anacardiaceæ.**

Rhus typhina, *L.* Not very abundant.

Rhus glabra, *L.* Not very abundant.

Rhus Toxicodendron, *L.* Very abundant.

**Vitaceæ.**

Vitis Labrusca, *L.* A few plants noticed.

Ampelopsis quinquefolia, *Michx.* Quite abundant.

**Celastraceæ.**

Celastrus scandens, *L.* A few vines noticed.

**Leguminoceæ.**

Trifolium arvense, *L.* Abundant on the railroad track.
Trifolium pratense, *L.* Quite abundant. Scattered.
Trifolium hybridum. One plant noticed.
Trifolium repens, *L.* Quite abundant.
Trifolium agrarium, *L.* One plant noticed.
Medicago lupulina, *L.* Only a few plants on the island.
Desmodium acuminatum, *D C.* Abundant in the west part.
Desmodium canescens, *D C.* Found a few years ago by Mr. C. E. Faxon. Not found since.
Desmodium Canadense, *D C.* Quite abundant.
Lespedeza capitata, *Michx.* A few plants in the extreme eastern part.
Lathyrus maritimus, *Bigelow.* A few specimens noticed a short distance from the island on the railroad track.
Lathyrus palustris, *L.* In extreme eastern part.
Apios tuberosa, *Mœnch.* Not very abundant.
Amphicarpæa monoica, *Nutt.* Abundant in western part.

**Rosaceæ.**

Prunus Virginiana, *L.* Not very abundant.
Prunus serotina, *Ehrhart.* A few small trees in western part.
Spiræa salicifolia, *L.* A few bushes.
Agrimonia Eupatoria, *L.* Scattered.
Geum album, *Gmelin.* Mostly near the hotel.
Potentilla Norvegica, *L.* Around the edges, north side.
Potentilla Canadensis, *L.*, var. simplex, *T. & G.* Abundant.
Potentilla argentea, *L.* A few specimens only.
Potentilla Anserina, *L.* Around the edges mostly on north side.
Fragaria Virginiana, *Ehrhart.* In extreme eastern part.
Rubus strigosus, *Michx.* A few specimens on north side.
Rubus occidentalis, *L.* Quite abundant.
Rubus villosus, *Ait.* Quite abundant.
Rubus Canadensis, *L.* Quite abundant.
Rubus hispidus, *L.* Mostly on the north side.
Rosa lucida, *Ehrhart.* Abundant.
Pirus arbutifolia, *L.*, var. erythrocarpa. Scattered, not abundant.
Amelanchier Canadensis, *T. & G.*, var. oblongifolia. A few trees in western part.

**Saxifragaceæ.**

Ribes oxycanthoides, *L.* A few plants.
Ribes floridum, *L.* Three plants noticed.

**Hamamelaceæ.**

Hamamelis Virginica, *L.* A few plants; scattered.

**Onagraceæ.**

Circæa Lutetiana, *L.* Abundant in the western part.
Epilobium angustifolium, *L.* Three or four plants noticed.
Epilobium coloratum, *Muhl.* Scattered.
Œnothera biennis, *L.* A few plants only.
Œnothera pumila, *L.* Not abundant.

**Lythraceæ.**

Lythrum Hyssopifolia, *L.* Abundant.

**Umbelliferæ.**

Cicuta maculata, *L.* One or two specimens.
Osmorrhiza longistylis, *D C.* Abundant.
Cryptotænia Canadensis, *D C.* Abundant.
Sanicula Marilandica, *L.* Abundant.
Carum Carui, *L.* One specimen only in extreme eastern part.

**Araliaceæ.**

Aralia nudicaulis, *L.* Abundant in western part.

**Cornaceæ.**

Cornus paniculata, *L'Her.* Abundant in southwestern part.

**Caprifoliaceæ.**

Diervilla trifida, *Mœnch.* In southwestern part.
Triosteum perfoliatum, *L.* Scattered. Not abundant.
Sambucus Canadensis, *L.* In extreme eastern part. A few bushes.
Viburnum dentatum, *L.* A few bushes around the edge.

**Rubiaceæ.**

Galium Aparine, *L.* Abundant.
Galium triflorum, *Michx.* Abundant.
Galium circæzans, *Michx.* Not abundant.
Houstonia cærulea, *L.* A few specimens only.

**Compositæ.**

Eupatorium purpureum, *L.* Abundant in western part.
Aster corymbosus, *Ait.* In western part. Scarce.
Aster lævis, *L.* Scarce.
Aster undulatus, *L.* Abundant.
Aster cordifolius, *L.* Abundant.

Aster multiflorus, *Ait.* Abundant.
Aster miser, *L.* Abundant.
Aster carneus, *Nees.* In western part in one spot only.
Aster longifolius, *Lam.* Abundant.
Aster Novæ-Angliæ, *L.* Mostly in one spot in eastern part.
Aster linifolius, *L.* Around the edge. Abundant.
Erigeron Canadense, *L.* Mostly on approach to the island from the beach.
Erigeron annuum, *Pers.* Scattered.
Erigeron strigosum, *Muhl.* In extreme eastern part.
Solidago cæsia, *L.* Two small patches in the western part.
Solidago bicolor, *L.* Not abundant.
Solidago sempervirens, *L.* Very abundant around the edges.
Solidago arguta, *Ait.* Abundant.
Solidago altissima, *L.* Not abundant.
Solidago odora, *Ait.* A few plants in the extreme eastern part.
Solidago nemoralis, *Ait.* Not abundant.
Solidago Canadensis, *L.* Two forms occur.
Solidago lanceolata, *L.* Scarce.
Solidago sp.? Perhaps a cross between S. sempervirens and S. altissima.
Iva frutescens, *L.* A few plants on the eastern edge of the island near the road.
Ambrosia artemisiæfolia, *L.* Abundant.
Xanthium strumarium, *L.* Abundant near the barn.
Rudbeckia hirta, *L.* A few plants in the eastern part.
Helianthus strumosus, *L.* Abundant.
Helianthus divaricatus, *L.* Abundant.
Bidens frondosa, *L.* Around the northern edge; not abundant.
Maruta Cotula, *D C.* Not abundant.
Achillea Millefolium, *L.* Scarce.
Leucanthemum vulgare, *Lam.* Two specimens only.
Artemisia caudata, *Michx.* Mostly on the road from the beach to the island.
Gnaphalium polycephalum, *Michx.* A few specimens in the extreme eastern part.
Gnaphalium uliginosum, *L.* A few specimens; scattered.
Antennaria margaritacea, *R. Br.* A few specimens in the extreme southeastern part.
Antennaria plantaginifolia, *Hook.* A few specimens in the extreme eastern part.
Erechthites hieracifolia, *Raf.* Abundant on northern border.
Circium discolor, *Spreng.* Three specimens.
Circium horridulum, *Michx.* In the extreme western part.

Circium arvense, *Scop.* Scarce.
Lappa officinalis, *Allioni.* Scarce.
Nabalus albus, *Hook.* Abundant in the western part.
Taraxacum Dens-leonis, *Desf.* About four plants seen.
Lactuca Canadensis, *L.* Not abundant. Scattered.
Mulgedium leucophæum, *D C.* Not abundant. Scattered.

**Campanulaceæ.**

Specularia perfoliata, *A. D C.* Abundant in the eastern part in the early part of the season. The form found was very small, and perfected the fruit without producing any corolla. It was identified for me by Mr. C. E. Faxon.

**Ericaceæ.**

Gaylussacia resinosa, *T. & G.* Only found in the extreme southeastern part.
Vaccinum Pennsylvanicum, *Lam.* Only found in the extreme southeastern part.
Vaccinum vacillans, *Solander.* Only found in the extreme southeastern part.
Vaccinum corymbosum, *L.*, var. atrococcum. A few plants.
Andromeda ligustrina, *Muhl.* One bush in the extreme eastern part.
Pyrola elliptica, *Nutt.* A few plants in the western part.

**Aquifoliaceæ.**

Ilex verticillata, *Gray.* Not abundant. Mostly around the western border.

**Plantaginaceæ.**

Plantago major, *L.* Abundant.
Plantago Rugellii, *Decaisne.* Abundant.
Plantago decipiens, *Barneoud.* Abundant around the western border.

**Plumbaginaceæ.**

Statice Limonium, var. Caroliniana. Abundant on the neighboring marsh.

**Primulaceæ.**

Lysimachia quadrifolia, *L.* Abundant.
Lysimachia ciliata, *L.* Abundant in the western part.

**Orobanchaceæ.**

Epiphegus Virginiana, *Bart.* Found by Mr. F. S. Collins a few years ago.
Aphyllon uniflorum, *T. & G.* Three plants in the eastern part near railroad.

**Scrophulariaceæ.**

Verbascum Thapsus, L. Not abundant.
Linaria Canadensis, *Spreng.* Near the railroad mostly.
Linaria vulgaris, *Mill.* Near the railroad mostly.
Scrophularia nodosa, L. A few plants in the middle of the western part.
Veronica arvensis, *L.* A few plants in the extreme eastern part.
Veronica peregrina, *L.* Scattered.
Gerardia purpurea, *L.* About a dozen specimens on the southwestern edge of the island.
Gerardia maritima, *Raf.* Very abundant on the neighboring marshes.
Gerardia quercifolia, *Pursh.* Abundant in the western part near the railroad.
Pedicularis Canadensis, L. In the extreme western part. Not abundant.

**Verbenaceæ.**

Verbena hastata, *L.* Scattered. Not abundant.
Phryma Leptostachya, L. *Bigelow*, Florula Bostoniensis. Not found since.

**Labiatæ.**

Teucrium Canadense, *L.* Abundant around the borders.
Trichostema dichotomum, *L.* One plant on the Eastern Railroad track.
Lycopus sinuatus, *Ell.* Abundant.
Hedeoma pulegioides, *Pers.* Abundant in the eastern part.
Collinsonia Canadensis, *L.* Quite abundant in the western part near the railroad.
Monarda fistulosa, *L.* A few plants in the western part.
Lopanthus scrophulariæfolius, *Benth.* A few plants in the middle of the western part.
Brunella vulgaris, *L.* Abundant.

**Convolvulaceæ.**

Convolvulus sepium, *L.* Abundant on the western border.

**Solanaceæ.**

Solanum nigrum, *L.* Near the house.

**Gentianaceæ.**

Gentiana Andrewsii, *Griseb.* Two plants only found.

**Apocynaceæ.**

Apocynum androsæmifolium, *L.* In northern part near railroad.

**Asclepiadaceæ.**

Asclepias Cornuti, *Decaisne.* Along the railroad bank.

Asclepias phytolaccoides, *Pursh.* In the centre of the western part.

**Chenopodiaceæ.**

Chenopodium album, *L.* Abundant.

Chenopodium hybridum, *L.* In the eastern part.

Atriplex patula, *L.*, var. hastata. Abundant around the border of the island.

Atriplex patula, *L.*, var. littoralis. Abundant around the border of the island.

Salicornia herbacea, *L.* Abundant on the marsh adjacent.

Suæda maritima, *L.* Abundant around the borders.

Salsola Kali, *L.* Mostly on the approach to the island from the beach.

**Amarantaceæ.**

Amarantus retroflexus, *L.* Abundant near the house.

Amarantus albus, *L.* A few plants only.

**Polygonaceæ.**

Polygonum Persicaria, *L.* Abundant.

Polygonum Hydropiper, *L.* Abundant.

Polygonum aviculare, *L.* Abundant.

Polygonum erectum, *L.* Scarce and somewhat doubtful.

Polygonum maritimum, *L.* Abundant on the borders.

Polygonum sagittatum, *L.* One plant only found.

Polygonum Convolvulus, *L.* Not very abundant.

Polygonum dumetorum, *L.*, var. scandens. Abundant in western part.

Rumex crispus, *L.* Abundant.

Rumex Acetosella, *L.* Abundant.

**Lauraceæ.**

Sassafras officinale, *Nees.* Abundant in the western part.

**Euphorbiaceæ.**

Euphorbia polygonifolia, *L.* Scarce. Abundant on the beach opposite.

Euphorbia maculata, *L.* Abundant on the railroad bank.

Acalypha Virginica, *L.* Abundant.

**Urticaceæ.**

Ulmus Americana, *L.* A few trees. Scattered.

Pilea pumila, *Gray.* Abundant in the western part. It all dried up and disappeared before flowering.

**Cupuliferæ.**

Carya alba, *Nutt.* Abundant.

Carya tomentosa, *Nutt.* Scarce. Two or three trees only.

Carya porcina, *Nutt.* Abundant.

Carya amara, *Nutt.* The most abundant hickory.

Quercus alba, *L.* Quite abundant. One of the largest trees; about fifteen inches in diameter, is a white oak.

Quercus bicolor, *Willd.* Most abundant in the extreme eastern part.

Quercus coccinea, *Wang.* There is one tree which seems to be intermediate between Q. coccinea and Q. rubra. It has the acorn of coccinea and the leaf of rubra. The leaf is rather small.

Quercus tinctoria, *Bart.* One tree in the extreme southeastern part. Identified by the fringed acorn and the bright orange inner bark.

Quercus rubra, *L.* Abundant. This species with bicolor constitutes the greater part of the oaks.

Corylus Americana, *Walt.* In the middle of the western part.

**Myricaceæ.**

Myrica cerifera, *L.* Not abundant.

**Betulaceæ.**

Betula alba, var. populifolia, *Spach.* A few small trees.

**Salicaceæ.**

Salix discolor, *Muhl.* A few bushes.

Salix humilis, *Marshall.* A few bushes.

Populus grandidentata, *Michx.* This species and the next occur together as small shrubs in the extreme southeastern part.

Populus tremuloides, *Michx.*

**Coniferæ.**

Juniperus Virginiana, *L.* The only conifer. A few trees only.

**Araceæ.**

Arisæma triphyllum, *Torr.* Abundant.

**Naiadaceæ.**

Ruppia maritima, *L.* In a pool of water near the island.

**Alismaceæ.**

Triglochin maritimum, *L.* Abundant on the saltmarsh adjoining.

**Orchidaceæ.**

Orchis spectabilis, *L.* Bigelow found this plant. It is now found in the western part. Some years it is abundant, while in others it is very scarce. It was abundant this year (1882).

**Iridaceæ.**

Iris Virginica, *L.* A few specimens on the southern edge.
Sisyrinchium Bermudiana, *L.* Not abundant.

**Smilaceæ.**

Smilax rotundifolia, *L.* In the northwestern part.
Smilax herbacea, *L.* Scattered.

**Liliaceæ.**

Uvularia perfoliata, *L.* Abundant.
Oakesia sessilifolia, *Watson.* Abundant.
Smilacina racemosa, *Desf.* Abundant.
Smilacina bifolia, *Ker.* Abundant in the extreme western part.
Polygonatum biflorum, *Ell.* Abundant in the western part.
Asparagus officinalis, *L.* One specimen only found.
Lilium Philadelphicum, *L.* In the extreme eastern part.
Lilium Canadense, *L.* Scattered.
Erythronium Americanum, *Smith.* Very abundant.
Allium Canadense, *Kalm.* Abundant.

**Juncaceæ.**

Luzula campestris, *D C.* Not abundant.
Juncus Balticus, *Dethard.* On the adjacent marshes.
Juncus bufonius, *L.* Abundant around the borders.
Juncus Gerardi, *Loisel.* On the adjacent marshes.
Juncus tenuis, *Willd.* Abundant.
Juncus acuminatus, *Michx.* Not abundant.

**Cyperaceæ.**

Cyperus Nuttallii, *Torr.* Not abundant.
Cyperus strigosus, *L.* Not abundant.
Cyperus filiculmis, *Vahl.* Not abundant.
Eleocharis obtusa, *Schultes.* One specimen found.
Eleocharis palustris, *R.Br.* A variety on the adjacent saltmarsh.
Eleocharis tenuis, *Schultes.* Quite abundant.
Scirpus pungens, *Vahl.* Near the railroad on the north side.
Scirpus planifolius, *Muhl.* One bunch in the western part.

Scirpus maritimus, *L.* Abundant around the borders.
Fimbristylis capillaris, *Gray.* On the railroad.
Carex stipata, *Muhl.* Not very abundant.
Carex sparganioides, *Muhl.* A few plants in the eastern part.
Carex cephalophora, *Muhl.* Abundant.
Carex rosea, *Schk.* Abundant.
Carex scoparia, *Schk.* Abundant.
Carex silicea, *Olney.* On the road from the beach to the island.
Carex cristata, *Schw.*, var. mirabilis, *Boot.* Abundant.
Carex straminea, *Schk.* Several varieties are found.
Carex virescens, *Muhl.* Scarce.
Carex laxiflora, *Lam.* Two varieties occur.
Carex Emmonsii, *Dew.* Abundant in the western part.
Carex Pennsylvanica, *Lam.* Abundant.
Carex lanuginosa, *Michx.* Not abundant.
Carex vestita, *Willd.* Not abundant.

**Gramineæ.**

Leersia Virginica, *Willd.* In the western part near the railroad. Scarce.
Alopecurus pratensis, *L.* Abundant.
Phleum pratense, *L.* Not abundant.
Agrostis perennans, *Tuckerman.* Two specimens only.
Agrostis scabra, *Willd.* Quite abundant.
Agrostis vulgaris, *With.* Abundant.
Agrostis alba, *L.* Abundant between the extreme eastern and the main eastern parts.
Muhlenbergia Willdenovii, *Trin.* A few specimens only in the middle of the western part.
Calamagrostis arenaria, *Roth.* On the road from the beach to the island.
Calamagrostis Canadensis, *Beauv.* Abundant.
Oryzopsis asperifolia, *Michx.* Found three specimens in 1879.
Spartina cynosuroides, *Willd.* Abundant around the edges.
Spartina juncea, *Willd.* Mostly on the adjacent saltmarsh.
Spartina stricta, *Roth.* Mostly on the borders of the creeks and pools adjacent.
Glyceria maritima, *Wahl.* On the adjacent saltmarsh.
Glyceria distans, *Wahl.* This species is a little doubtful.
Brizopyrum spicatum, *Hook.* Abundant on the adjacent marsh.
Poa annua, *L.* In front of the house in the eastern part.
Poa compressa, *L.* The most common grass.
Poa serotina, *Ehrhart.* Abundant.
Poa pratensis, *L.* Abundant.

Poa trivialis, *L.* A little doubtful.
Festuca ovina, *L.*, var. duriuscula. Scarce.
Festuca elatior, *L.* Abundant.
Festuca nutans, *Willd.* Abundant in the western part.
Phragmites communis, *Trin.* Three specimens in the northwestern part.
Triticum repens, *L.* Abundant.
Elymus Virginicus, *L.* On the approach to the island mostly. Scarce.
Elymus striatus, *Willd.* Quite abundant in the western part.
Gymnostichum Hystrix, *Schreb.* Abundant in the western part.
Danthonia compressa, *Austin.* Abundant.
Hierochloa borealis, *R. & S.* Quite abundant.
Anthoxanthum odoratum, *L.* A few specimens only.
Panicum virgatum, *L.* Abundant around the borders.
Panicum latifolium, *L.* Abundant.
Panicum pauciflorum, *Ell.* Abundant.
Panicum dichotomum, *L.* This species is a little doubtful.
Panicum sanguinale, *L.* Mostly on the railroad.
Panicum capillare, *Bosc.* Mostly on the railroad bank.
Panicum Crus-Galli, *L.* A few specimens found.
Setaria glauca, *Beauv.* Mostly on the railroad bank.
Setaria viridis, *Beauv.* Mostly on the railroad bank.
Setaria Italica, *Kunth.* Two or three specimens only found.
Andropogon furcatus, *Muhl.* A few specimens found in 1880.

**Equisetaceæ.**

Equisetum arvense, *L.* Abundant.

**Filices.**

Pteris aquilina, *L.* The most abundant fern.
Aspidium Thelypteris, *Swartz.* Abundant.
Asplenium Filix-fœmina, *Bernh.* Scarce.
Onoclea sensibilis, *L.* Not abundant.

**Ophioglossaceæ.**

Botrychium Virginianum, *Swartz.* Very fine specimens obtained. Not abundant.

The following is a list of mosses collected this season (1882). The list is undoubtedly incomplete, as many must have escaped my notice.

## MUSCI.

Fissidens osmundioides, *Hedw.* Rare. One specimen only obtained.
Ceratodon purpureus, *Brid.* Not common.
Trichostomum pallidum, *Hedw.* Very common in the western part.
Orthotrichum strangulatum, *Beauv.* Abundant on trees.
Orthotrichum Hutchinsiæ, *Smith.* On rocks. Not abundant.
Hedwigia ciliata, *Ehrh.* Not very common.
Atrichum angustatum, *Beauv.* Common.
Polytrichum commune, *L.* Common in the eastern part.
Polytrichum juniperinum, *Hedw.* Common in the eastern part.
Mnium affine, *Bland.* Very common.
Mnium hornum, *Hedw.* In one spot in the northwestern part.
Bryum cæspiticium. Frequent.
Funaria hygrometrica, *Hedw.* Not common.
Physcomitrium pyriforme, *Br. & Sch.* Not common.
Anomodon attenuatus, *Hub.* On one rock in the western part. The species is somewhat doubtful.
Thelia hirtella, *Sulliv.* On trees. Not common.
Cylindrothecium seductrix, *Bryol. Europ.* Not common. One specimen only obtained.
Hypnum cupressiforme, *L.* Not common.
Hypnum nitens, *Schreb.* Not common. Determination very doubtful.
Hypnum salebrosum, *Hoffm.* Common.
Hypnum rutabulum, *L.* One specimen only obtained.
Hypnum populeum, *Hedw.* The most abundant moss.
Hypnum hispidulum, *Brid.* Rare.
Hypnum serpens, *Hedw.* Quite abundant on rocks with H. populeum.
Hypnum adnatum, *Hedw.* Rare.

## HEPATICÆ.

Lophocolea heterophylla, *Nees.* Not common.
Madotheca platyphylla, *Dumortier.* Common on the rocks.
Frullania Grayana, *Montagne.* Common on trees.

# OPENING OF A NEWLY DISCOVERED SHELL-HEAP AT IPSWICH.

COMMUNICATED BY JOHN ROBINSON.

THE shellheaps in the vicinity of Ipswich have long been a subject of study and investigation for the archæologists of this region. Messrs. Wyman, Putnam, Morse, Cooke, Lebarron and others have, from time to time, worked upon these shellheaps and collected many interesting specimens from them besides adding to the scientific knowledge of the subject. In no single instance, however, has any particular shellheap been carefully turned over from end to end, nor have the contents of a heap been collected and preserved as a special collection. This is to be regretted, as there is now hardly any shellheap to be found in this vicinity at which some one has not worked to a greater or less extent.

Early in September (1882), Mr. I. J. Potter of the Ipswich Chronicle, an earnest student of the Indian remains in the neighborhood of Ipswich, called the attention of the officers of the Peabody Academy of Science to a shellheap which he had observed on the shore of Ipswich river. An examination showed that this heap had never been disturbed and it was at once determined to investigate it carefully and to retain as one exhibit everything of scientific value that might be obtained. Permission was kindly given to the Academy by Mr. Perkins, the owner of the land upon which the heap was found, to do the work, and on September 17, the first examination was made.

The shellheap is situated on the northeastern end of Perkins island in Ipswich river, now incorrectly known as

Treadwell's island, it having been in possession of the Perkins family for several generations during the early days of Ipswich, when it was always recorded on deeds by that name. The heap was oval in form and bordered upon the salt marsh for about one hundred feet, and extended back towards the southwest some sixty feet, where it became of little depth and was lost in a ploughed field. The depth of shells varied from a few inches on the outside to rather more than three feet in hollows. The southern end of the heap was composed almost entirely of oyster shells, reaching in places to a depth of over two feet and extending over a space ten feet square, and another smaller space towards the northern end was also entirely composed of these shells to about the same depth. The larger portion of the heap was, however, of clam shells intermixed with those of the hen clam and quahaug, black earth, charcoal, burnt stones and bones, with here and there, the shells of the mussel, cockle and limpet. Where the oyster shells were thickest but few other objects were found. One perfect valve of the smooth species of Pecten was collected; the species so common in the shellheaps at Marblehead being entirely absent. Three sinkers were found near the centre of the heap, at a depth of one foot and but a few feet apart. A few arrowpoints, knives, rude stone implements and chips were collected in various places, and, at different depths, a broken gouge and portions of other implements including a socket or handle apparently made from the antlers of a deer. At the bottom, everywhere, were the shells of the *Helix albolabris*, the common land snail, and in similar situations but less frequent, were those of another snail. In the lower stratum, covering a space of about two square feet, was quite an amount of some friable substance which has not yet been identified, but which may prove to be the

remains of some large fish. Several interesting bone implements were collected, and the bones of various mammals, birds and fishes were found in considerable quantity. In one spot, at the depth of two feet in the clam shells and debris, nearly two quarts of human bones were found broken into short pieces. Very little pottery was discovered and that was of a coarse quality and but slightly ornamented. One or two of the shells found were pierced with small holes as if used as ornaments.

The uninjured valves of the clam shells preserved show a great variety in form : some are rough, thick and narrow, while others are thin, large and very wide. Among the bones found were three pieces which appeared as if thoroughly calcined, and when struck gave out a metallic ring. It was noticed that only one specimen of *Natica duplicata* was collected, while in other heaps it is abundant. The oyster shells were all very much broken, and it was with difficulty that a sufficient number of whole valves were preserved for comparison and study. It should be borne in mind that the oyster is not now found in these waters.

The bones of a rodent were found nearly a foot below the heap, doubtless those of some animal that died in his burrow which extended through the heap, as such burrows were here and there noticed, and some of the other bones found in the heap had been gnawed by a rodent.

It is not intended here to enlarge or theorize upon the results of this exploration, but only to give the facts in the simplest manner, upon which, the specialist may build a story of the people whose homes and firesides were on or about this refuse pile.

It has been impossible to identify accurately all the bones found, and therefore only a rough outline can be given here of the contents of the shellheap, which may be summarized as follows :

Stone chips, 50; burnt broken stones, 20 preserved; round stones, 11 preserved; long stone, 1; arrowpoints, 6; arrowpoints (broken), 5; sinkers, 3; potsherds (two pots), 26 pieces; bone implements, 5; human bones and teeth (1 adult, and 1 child), 2 qts.; bones of various animals including those of the deer, moose(?), bear, wolf, and two other carnivorous species; several species of birds, including the turkey; a few bones of the turtle and of the porpoise, and numerous fish bones, 3 qts.; pierced shells (Mya), several; charcoal and unidentified substance.

The Mollusks preserved were :—

*Venus mercenaria*, *Ostrea edulis*, *Mya arenaria*, *Mactra solidissima*, *Mytilus edulis*, *Crepidula fornicata*, *Pecten tenuicostatus*, *Purpura lapillus*, *Natica heros*, *Natica duplicata*, *Neptunea islandica*, *Hyanassa obsoleta*, *Helix albolabris*, *Anguispira alternata*.

Mr. F. W. Putnam remarked that the collection before us is one of great interest and importance. The bringing together of relics from the shellheaps is a matter of interest at any time, but to carefully collect and preserve, as a complete exhibit, the entire contents of one such heap is of vastly more value. It gives us important facts in the history of a family in one epoch. This collection is in many ways a remarkable one. In the first place it contains more stone implements than have been found in all the other shellheaps of this vicinity investigated by Wyman, Morse, Cooke and myself put together. Of course the oyster was abundant in the neighborhood when this heap was formed, although it is well known that it is impossible to collect them in any numbers in this vicinity now, and the Pecten, too, is now rare about our bays. Among the shells preserved I notice several pierced as if used for ornaments. Of the bone implements,

one is a perforator made from deer bone, and others are fish spearheads almost precisely like those from Alaska and the Western Eskimo. The specimens of land snail (*Helix albolabris*) are very numerous, the animal having undoubtedly gone under the shells to hibernate, as they were found at the bottom of the heap. It is curious to note the small amount of pottery collected, portions of two pots only having been found.

But the most interesting part of the collection before us is the box of human bones, all collected in one spot and broken up as if for the stew pot in precisely the same manner as those of the moose, deer, bird and other bones collected in this same heap and now in this case. That cannibalism was practised by the early inhabitants of this region there is no doubt. Wyman has found convincing evidence of this in Florida, and history records its occurrence in some parts of this continent in comparatively recent times. It might not have been cannibalism purely for the love of human flesh, but practised as a sort of religious or superstitious rite. Many tribes believed that to eat the flesh of a captured brave of the enemy incorporated his valor with their own, and more than that, it would prevent him from being an enemy in the world beyond, for if devoured, was he not then a part of themselves? This may be the explanation in this instance, and these broken pieces of bones may be the relics of such a feast.

Regarding the age of these heaps no definite conclusions can be drawn. That some extend far back into prehistoric times there is no doubt, while others were formed in part after European contact with the Indians, as shown by objects of European make found near the surface on some heaps. It is, however, only by such investigations as these which Mr. Robinson has conducted, that a com-

parative chronology can be obtained or a true history of the people who made them be established.

## ARROWMAKER'S WIGWAM AT PINE GROVE.

Communicated by John Robinson.

During the latter part of September, 1882, Mr. J. H. Sears and myself visited the Pine Grove region in Marblehead for the purpose of examining some of the shell-heaps, but finding nothing of interest in them we were about to return home, when our attention was attracted by numerous pieces of upturned turf, where some of the young relic hunters from South Salem had made random diggings in search of "Indian relics." In one of the little excavations we noticed numerous porphyry chips, and for want of other occupation began to dig in the vicinity, saving all the chippings found. As we proceeded, we noticed that the chippings were all within a few inches of the surface, just beneath the turf, on an undisturbed yellow loam, and that they were all found in a band of about eighteen inches in width, which was also observed to take a curving shape. Continuing the work, we at last found ourselves at the point at which we started, having collected some four quarts of sharp chips of porphyry, of the sort found in the neighborhood of Marblehead, besides a few broken implements resembling large spearpoints. The circle represented by the band of chippings was eight and one-half feet in diameter, and was probably formed by the old arrowmaker who occupied a wigwam of that breadth, and who swept to the edges of his house the chips he had made during his work, leaving for us a perfect

ground plan of his dwelling, and the evidence of his industry.

Besides the chips and broken implements we collected, there have been added to them others obtained by Arthur Toppan, who, it was found, had commenced the excavation a few days before, and who then noticed and collected some of the chippings.

Near by was a very shallow shellheap extending some distance at one point being within four or five feet of the circle of chips. The site of the wigwam was at the edge of a pretty hill overlooking Forest river to the southwest. The specimens collected are now all in the museum of the Academy.

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# BULLETIN

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## SWEDISH SUPERSTITIONS AND CHARACTERISTICS.


BY ALBAN ANDREN.



READ MONDAY, JANUARY 1, 1883.


You find among the Swedes many peculiar superstitions, which seem to cling with great tenacity from by-gone times. So, for instance, it is the custom for chamber-maids or others, making the beds in the morning, not to leave an unfinished bed under any pretext to go to any other work, for fear that the person that is to occupy it may not rest easily. In most Swedish stables you will find a dead crow or blackbird hung over each horse, which is considered a sure prevention for the evil one riding the horse in the stable at night, and it is asserted by the farmers that when such prevention is not taken the horses are found in the morning foaming at the mouth, sweaty and blowing hard, as if just arrived from a furious drive. In my boyhood, whenever a person sneezed it was considered polite for bystanders to say "God save you" or "Prosit;" and the more popular a person was in society the more people were ready to say "God save you" in case of sneezing. At an evening party, a society belle, after being duly coaxed, would sit down and commence fingering the

ivories of a piano, and it was ludicrous enough if she happened to sneeze to see about a dozen young men and old men make deep bows, and seriously exclaim in chorus, "God save you, Mademoiselle," she returning the compliments with a gracious "Thank you, sirs." This custom is still retained among the Irish, who say "bless you" or "save you" on similar occasions. It is said that centuries ago a contagious disease passed over Scandinavia and northern Europe, which commenced with sneezing, and after sneezing a few times it ended fatally; and naturally under such circumstances the friends of the sneezers would exclaim "God help you" or "save you," and thus it came to be handed down from one generation to another, until it became a standard form of etiquette. It is now, however, growing out of fashion. In families, particularly among the fair sex, it is a sure sign of becoming angry and hot-tempered during the day if the nose itches in the morning; also, if the palm of the left hand itches, you are to receive money, and if it is the right hand you have to pay out money during the day.

If the left eye itches, a lady caller may be expected, and if it is the right eye, then a gentleman is sure to call during the day.

One saying is, never point an empty gun at anybody, for the evil one may load it; and further, never make a wry face, for if the clock should strike twelve, the wind change, and the cock should crow at the same time, your face will forever remain in that ugly condition.

Many poor students manage to get through the elementary and regular colleges by the aid of charity meals, which is done in this way:

A student calls at your house and asks that you will invite him once a week to your table, dinner or supper; and after getting such permission in one family he goes to another and asks a similar privilege, and so on until he

has secured free dinners and suppers for the whole week during the term. No shame seems to be attached to this free lunching; and as a rule, each family tries to set a better table on poor students' day than on any other, although there are exceptional cases in which the reverse is done.

Some of the shining lights among the Swedish professional men have passed through college by the aid of such charity meals, and are not ashamed to confess it.

If there is one class of people that ought to be prosperous in Sweden, it is the hatters, for owing to the Swedish etiquette of uncovering your head in the street to mere passing acquaintances, the brim of the hat soon wears out; and an American gentleman, lately returned from Sweden, told me that the next time he goes over there, he surely should get a silk hat made with a sheet iron brim, to enable it to stand the strain put upon it by the demands of the prevailing etiquette. Even two brothers, and chums, as we say here, when they meet in public, take off their hats at meeting and parting with a great deal of reverence. Your own servants meet you in the street, and as they doff their hats or make a courtesy, you are expected to raise your own in return. It is also the etiquette, if parties pass each other on the left to raise their hats with their right hands, and *vice versa*, so as not to obscure your face from your friend in raising the hat. In going into offices, stores, restaurants, bar-rooms or billiard saloons, the Swede uncovers his head just as reverently as if going into church. In the country the farmers and peasants generally uncover their heads in going by churches or cemeteries, as a mark of respect.

Writers on Sweden have said that no real deep religious sentiment exists in that country, and this is equally true, I think, wherever state and religion are united, for in Sweden you *must* be baptized when two years old, whether you want to or not. You may bawl and kick all you like

but baptized you must be; there is no getting away from that. At fifteen you must join the church and be confirmed, and at that age you have ceased to be rebellious and fall in to the traces with proper grace. Then you ought to go to the sacrament at least once a year, and you may forfeit certain citizens' rights should you not have been to such holy communion for a period of five successive years. Thus you see that religion and business are, as it were, closely linked together, and by degrees you begin to perform your religious duties in a sort of automatical manner, very reposing both to body and mind. Any undue excitement in religious matters, such as noisy revivals, etc., is not enjoyed by the better classes of Swedes, although foreign missionaries, particularly Swedish-Americans, occasionally do a little missionary work among the country people in this line, and it would be a great deal better for the peace of the country if they would confine their labors to fields more ripe for the harvest.

The Swedish barber is a man of no little importance, as in addition to the usual duties of hairdresser, wig-maker, and barber, he has to pull teeth, set leeches, attend to bleeding and cupping, and occasionally, practises a little surgery if he has passed examination in that line. Never shall I forget my first experience in having a tooth pulled by a Swedish barber. I went up the stairs to his rooms, but in taking hold of the door-knob, the tooth-ache disappeared, and I went down to the street again, when the ache commenced worse than ever. I returned, although the same miracle was repeated when I got to the door again. I made bold to enter. He was alone, that man of torture, and, after looking me over, he asked me to sit down on the floor near the window, and took out from a drawer a mysterious tool, looking very much like a large corkscrew; with this he took hold of the tooth, standing over me with one hand resting on the top of my head, and with the other

pointing upwards, just as you pull a cork from a quart bottle. After getting one-half of the tooth out, the door opened, and in came a man to be shaved, and the barber asked me to wait till he had shaved the customer, when he would try again. I sat on the floor waiting till the man was shaved, when the barber commenced almost the same operation, almost lifting me from the floor, until at last his efforts were crowned with a glorious success. The charge was about ten cents. Some years afterwards, an American dentist from Philadelphia settled in Gothenburg, and fitted up luxurious parlors with operating chairs and all the modern Yankee fixings, and everybody predicted a quick failure if he meant to keep to dentistry alone, without doing some shaving, hair-cutting, and wig-making, with occasionally a little leeching, bleeding and cupping; but to the astonishment of all, he built up a large practice, and others, following in his wake, have now in a great measure relieved the barber from his primitive method of dentistry. "Allah be praised!"

Easter eve is celebrated by a family gathering and a late supper, consisting of boiled rice and hard and soft boiled eggs, with the usual allowance of wine.

A story is current in Sweden of a charity student being invited at such Easter eve supper to the family in which he had his free meals; before him stood the large deep bowl filled with the customary boiled rice, and on either side a decanter of wine. The room was lighted by two candles on the table, and in snuffing them both were accidentally put out, and the maid sent out to the kitchen to relight them; when all were in darkness the student thought he would improve the opportunity to take a long draught from one of the wine decanters, and after doing so he set it down softly on the table, but when the lights were brought in, it was found to the astonishment of all that instead of putting the decanter back again on the table, he

had placed it deep in the middle of the bowl of rice before him. Tableau: French leave, and no more free meals for the unlucky student in that family.

When darkness sets in on Easter eve, you will see all the hills lighted up by great bonfires which are kept up till sunrise on Easter day. This is done in memory of an old superstition that the devil and witches had full sway on the earth during the days the Savior laid in the grave, and particularly on Easter eve it was said that the witches by riding on brooms through the air would congregate on the hill-tops and concoct evil doings for the human race, and to keep them away the superstitious people would light every available hill-top with rousing bonfires.

As the witches are all dead long ago with the exception of their flaxen-haired and blue-eyed fair descendants which the Swedes don't want to scare away, you see there is no actual need at the present time to keep up these Easter bonfires, except as a time-honored custom, and it is one of the features of Easter eve for families to go out to look at the display of bonfires in the evening, after supper.

The 25th day of June, in Sweden, is St. John's day, or midsummer day, and is one of the most social and enjoyable holidays in Sweden. The evening before is midsummer night, which is celebrated by decorating of May-poles, around which the peasants dance till early dawn. Months before this festival, the peasant girls will save the egg-shells by carefully blowing out the contents; such empty egg-shells are strung on a twine like beads on a string and the green covered May-pole is wound spirally by such egg-shells, looking at a distance like white pearls on a dark green ground, and has a very pretty effect. Besides this the May-poles are dressed with flowered hoops, garlands and bright ribbons, and for a couple of months afterwards you will see the May-pole standing on the village green as a monument of a joyous and happy occasion.

It is not without interest, once in a while, to find out what other people think of us. By us, I mean we Americans.

On leaving England, where I lived a year and a half I was told by the cashier of the iron establishment where I worked in Lancashire, that the Americans were very queer people; and he asked me if I had bought a revolver to take with me to Boston.

I said no; for I confessed I did not know how to use one, and I was afraid I would do myself more damage than good, and he said he was very sorry, for he knew I would not have a very long lease of life in New England without one.

I have been here about fourteen years, from Maine to Illinois, from Canada to North Carolina, and to the honor of this country, I want to say I never owned one and never had the need of that weapon during this long time. He also stated very seriously that if I went to churches in New England, I would see the men resting their feet on the top of the pew in front, and that they were in the habit of smoking pipes while in church. The first time I went into a New England church, I sat anxiously waiting to see the men put their feet on the pew in front and pull out their pipes, but I was very agreeably disappointed, and I have come to the conclusion that the New Englanders, although they are a young race, are almost as civilized as the people of Great Britain.

I also heard of a German who emigrated to this country and afterwards married an estimable young American lady, at which his parents were very much distressed; and when some years afterwards he travelled with his wife to see the old folks, they were greatly relieved at seeing the young wife; for they said, we thought all the time that coming from the United States she must be black, and she is just as good-looking as we are.

Now the ordinary Swedes also have a very imperfect

knowledge of this country, that is, as to its extent and relative location of cities and states. This is not to be wondered at, for the same I believe is true as to the general American knowledge of the localities in Sweden; and what care we here for the relative position of such hard-sounding names of Swedish counties as Bohnslau, Dalsland, Westergotland, Ostergotland, Kalmar, Skaue, and Smaland; so you must not think that we Swedes are very ignorant and verdant because we do not know the geography of the United States, and this the more, as in our Swedish school atlases, Sweden and Norway occupy a couple of double pages, whereas only a small portion of a page is devoted to the whole of North America, and we naturally come to the conclusion that distances in the United States are small as compared with Sweden, and it is only by travelling through the United States that we get a proper idea of the vast extent of the country. I make this explanation that you may understand what follows: about fourteen years ago, when I left Sweden for the United States, a number of friends called on me and said they had heard I was going to Boston, U. S. A., and would I be so kind as to take a letter and message with me for some relation or friend of theirs. Oh, yes. I took about twenty-five letters addressed to persons in Illinois, Wisconsin, Minnesota, and New Sweden, Maine, my friends saying that such places were not far from where I was going, and they and I had an idea that they were all suburbs of Boston, and that it would be a pleasure to deliver the letters in person.

When I arrived in Boston, I met an American gentleman to whom I had a letter of introduction, and after taking dinner with him, he asked me what I meant to do. I said I was going to work in a day or so, but that I had first a number of letters to hand round to friends in the suburbs of Boston, and I would be obliged to him if he

would tell me what kind of horse-cars to take to reach such places. He said certainly, "please show me the letters," which I handed to him; and as he began to read Illinois, Wisconsin, Minnesota, Texas, Missouri, and New Sweden, Maine, he looked at me with a strange expression in his eyes, and I began to fear I did not please him, so I asked him what the matter was, and he said he thought I might be tired after my long journey, and if I would pay him three cents apiece for the letters, he would see to it that they would reach their owners. I thought he was remarkably kind to offer to run round for me at that price, and it was not until some time afterwards that I found out that he engaged Uncle Sam to deliver my letters, and that the directions thereon were States situated thousands of miles apart, instead of being suburbs of Boston.

The Indians are ever an interesting subject for the Swedes at home to enquire about, for they seem to have an idea that Boston has about as many Indians as white people among its population, and I was asked this summer if I had had much trouble with the Indians, and if I was not afraid of being scalped, and all such matters, to which I replied that as far as my observation had been among the Boston Indians, I had found them very orderly and peaceable, and that, in fact, the most of them were very well-behaved, being mostly employed as sentinels outside cigar and tobacco shops.

A bald-headed person coming from the United States to Sweden excites a great deal of curiosity among the common people in that country, for it is hard to convince them that he has not left his scalp suspended, as an ornamental appendage, to the belt of one of the noble red Indians of the Boston prairies.

## RECORDS OF THE CITIES AND TOWNS OF ESSEX COUNTY. INFORMATION ON THEIR CONDITION REQUESTED.

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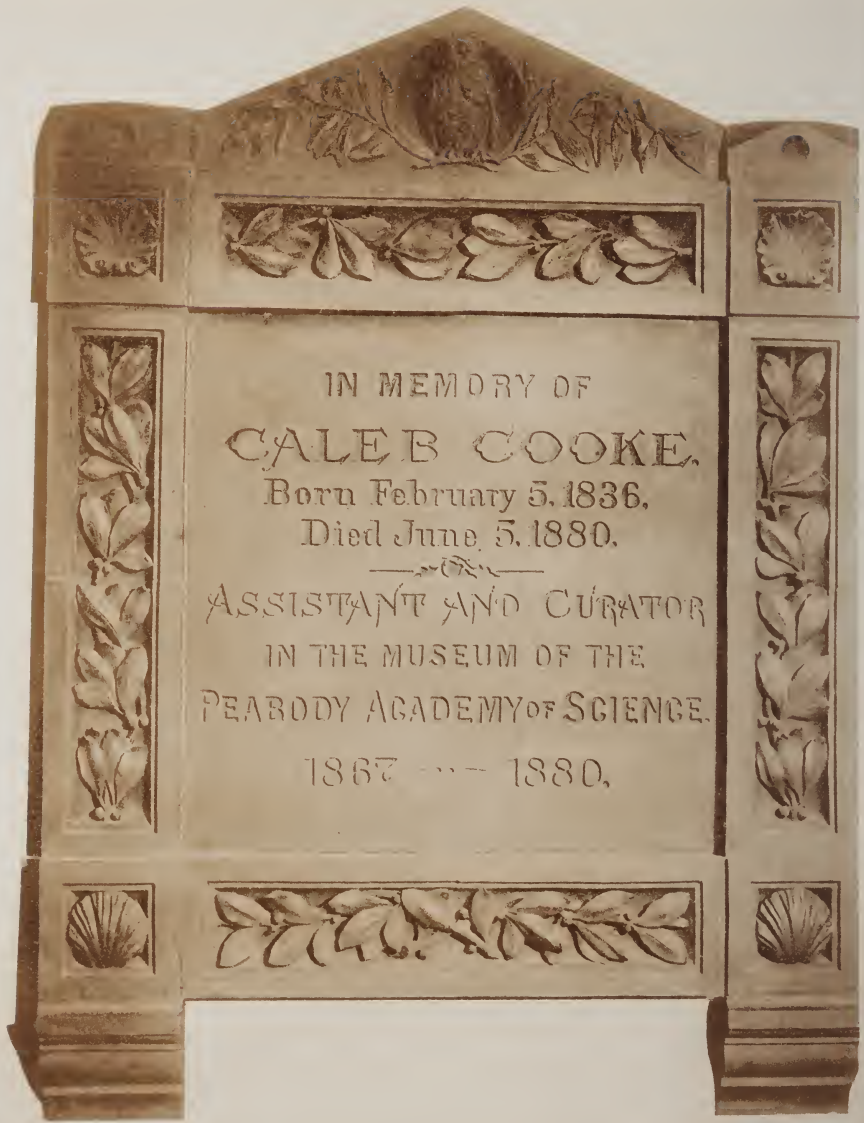
At a regular meeting of the Institute held on Monday evening, February 5, 1883, Vice President Robert S. Rantoul stated that he had corresponded with John T. Hassam, Esq., of Boston, who is interested in a plan for a thorough examination of the town and city records in this Commonwealth, to ascertain their present condition, also looking to their preservation and to the adoption of the most approved methods of arrangement.

The increasing interest, during the past few years, in genealogical and historical investigations, has imparted to these records a due appreciation of their value as depositories of historical information and the great need of the fostering care of the legislature and of those in authority.

Mr. Rantoul showed some blank forms of a circular which had been prepared for the use of the town and city clerks, so that a uniformity in the returns may be observed; also a circular-letter to be signed by the President, soliciting a response to the questions proposed.

Mr. Hassam has requested the coöperation of the Institute, and is desirous that it would take charge of the sending of the circulars and the receiving of the returns from the clerks of the cities and towns of Essex county, mentioning that other societies in the state had been invited to coöperate and to assume their respective proportion of the work required.

The subject was referred to a committee consisting of Messrs. Robert S. Rantoul, Henry F. Waters, and James A. Emmerton with authority to act.


IN MEMORY OF
CALEB COOKE.
Born February 5, 1836.
Died June 5, 1880.
ASSISTANT AND CURATOR
IN THE MUSEUM OF THE
PEABODY ACADEMY OF SCIENCE.
1867 — 1880.

## PRESENTATION OF THE CALEB COOKE MEMORIAL TABLET TO THE TRUSTEES OF THE PEABODY ACADEMY OF SCIENCE, JAN. 12, 1883.

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The subscribers to the Caleb Cooke Memorial Tablet met in the lecture room of the Academy on Friday evening Jan. 12, 1883, for the purpose of transferring to the trustees of the Academy the mural tablet which had been placed in the hallway a few days before.

Mr. John Robinson presided at the meeting and introduced the subject as follows: During the spring of 1882, a few friends of the late Caleb Cooke, feeling that his untiring interest and long continued services in behalf of the scientific institutions of Salem should in some way be recognized, and that a simple record of his work should be placed before the eyes of the public, suggested the advisability, by a general subscription, of raising a sum of money sufficient to purchase and place in the museum, where so much of Mr. Cooke's life had been spent, a fitting mural tablet to his memory.

The suggestion met with the cordial approval of all and, without solicitation other than a short notice in the Salem newspapers, nearly the required sum was raised in fifty cent subscriptions. This was augmented by the proceeds of an entertainment and a few larger subscriptions from intimate friends.

The trustees of the Academy gladly approved of the project, and at once a committee of the subscribers arranged with the Boston Terra Cotta Company for a suit-

able tablet and border from original and appropriate designs. This upon being moulded proved even more satisfactory than was expected, and was soon completed and placed in the position selected at the Museum, the work of setting the tablet being gratuitously performed by Mr. Joseph N. Peterson, the Academy's mason.

It would not be the wish of our late friend that we should come here in a spirit of sadness, but rather that we should meet socially and pleasantly as he himself was always wont to do. It is fitting too that, in this hall where, yearly, thousands of visitors pass to and fro, a simple memorial should meet their eyes and continually remind them of one who contributed so much towards the collection of the specimens and the arrangement of the Museum.

Mr. Robert S. Rantoul, in behalf of the subscribers, presented the tablet to the trustees in the following words:

The friends of the late Caleb Cooke, and it was my pleasure to be counted among them, have commissioned me to tender, in their name and behalf, to the trustees of the Peabody Academy of Science, the mural tablet which they have placed here, to be a memorial as lasting as it is unique and beautiful, of our lamented friend, an officer of this school of science.

It is well that here, in the very scene of his labors, the generations who are to enjoy the fruits of them should pause before this simple slab. It matters little now that he whose name it bears was the pupil and coadjutor of Agassiz,— that he had been a voyager in both continents of the Southern Hemisphere,— that he lived here or there died. But it matters much for all time to know that here was one who could forego the keener gratifications of the hour for the sake of lasting good. Here

was one who was happier to toil modestly and inconspicuously at the far-off solution of those endless problems of the material world, so the result obtained might be ever so little a modicum of truth, rather than to struggle after the unsubstantial prizes of reputation and of life, so apt to crumble in the hands that snatch them. Here was a man who found content in friendships,— his highest pleasure in human sympathy and modest work. Other men understood and professed that usefulness is happiness and that there is no higher good than doing for others what good we can. Here was a man who felt and acted it. And if it be true indeed, that getting and giving are the be all and end all of American life, then it is well that this elegant memorial shall attest the fact that here, amongst us, in this bustling nineteenth century of ours, there lived and died a quiet worker, little known and caring little to be known beyond his sphere, wise enough to know that no getting more enriches than the getting, out of her secret storehouses, of Nature's jewels of knowledge,— that no giving more truly warms the heart of giver and taker, and is twice blest, than the giving of knowledge.

We need not here recount the simple phases of this life too early spent. They are a familiar portion of our household history. To the labyrinthian mazes of this noble museum his mind was the clew. It was said, somewhat extravagantly, that he could put his hand, in the dark, on every specimen, but of how many of those specimens was it the fact that his hand had placed them where they were. I say nothing of his philanthropy, of his broad catholicity of spirit, of a score of estimable personal traits, each as conspicuous as his unswerving love of science. Other occasions have been found to speak of them, and others will speak of them

here; my function is less broad. For those of the passing generation who knew our friend there is no need of word or tablet to keep his memory fresh. The laurel, perennial green, the shells reversed, the bird of wisdom, seeing through the darkness, these are fitting emblems, were emblems needed, of the memory of our loss. But for that greater multitude which follows on, to which his life will be a myth and his life-work will be only merged in the mighty aggregate of modern scientific thought, let this slab remain, while this noble monument, the Peabody Academy, shall stand, to attest that only those who serve are worthy, and that by the side of wealth which grandly endows science, is to be commemorated with equal gratitude that life-consecration which makes science and its grand endowment possible.

At the close of Mr. Rantoul's address, Dr. Henry Wheatland, Vice President of the Peabody Academy of Science, accepting the memorial, responded in behalf of the trustees, as follows:

It is much to be regretted that on this occasion our honored President is not here to respond in fitting terms to your appropriate remarks at the unveiling of this memorial given by many friends, in recognition of the relations of Mr. Cooke to this institution.

The President has been for several months in Europe and will probably remain until the spring or early summer when I hope that he will return with greatly improved health, which had been much impaired by arduous and exhaustive labors on the bench of the Supreme Court.

Some thirty years ago, a tall, red-haired youth, not out of his teens, came to the rooms of the Essex Institute and desired to be a member. He was elected May 11, 1853, and continued his membership from that time

until his decease, taking a deep interest in its objects and in the natural sciences, and for more than twenty-one years of this period held some official position, or a place on some important committee.

Caleb Cooke was the son of William and Mary (Fogg) Cooke, and was born in Salem Feb. 5, 1836. His father was a mariner and for several years was an officer on board of vessels engaged in the West African trade and died in California when the son was in his boyhood. He was educated in our public schools, and commenced active life as a clerk in the bookstore of Henry Whipple & Son, continuing in this position only for a short time when he left. After spending about one year with George F. Read in the study of the languages, especially the Latin, he devoted himself principally to the pursuit of natural history, which had long been his inclination.

To this end he went to Cambridge and pursued his studies under Prof. L. Agassiz, *the great teacher*, who during his residence in this country had done so much to stimulate the study of nature and a spirit of scientific investigation, commenced the formation of the Museum of Comparative Zoology, and gathered a class of pupils, many of whom have contributed much to advance his plans and have become distinguished. They hold or have held many prominent positions, professorships in our various seats of learning, the charge of museums, conducting scientific explorations, or preparing communications to the publications of learned societies or the journals of the day, or separate treatises on their respective specialties. Such were his associates during his connection with Agassiz.

In 1859, at the request of Professor Agassiz, he went to Para, Brazil, to collect specimens for the Museum, and in 1860 he went to Zanzibar on a like mission, sailing from Salem in the bark Persia on the fifth of November of

that year. He remained in this field of labor until he was compelled to leave on account of sickness, having the African fever, but almost recovered his health during his passage home, arriving at Providence per English bark Sheffield, May 17, 1865, after an eighty-two days' passage from Zanzibar.

While he was absent, Professor Agassiz and Senator Sumner procured for him the appointment of United States Consul at Mozambique, but the commission passed him in transit and he never acted under it, although his name was borne upon the rolls for several years.

From the organization of the Peabody Academy of Science in March, 1867, until his decease, he was an Assistant and one of the Curators of the Museum under its charge.

He was a member of the American Association for the Advancement of Science, and of the Boston Society of Natural History.

In 1875, he assisted Dr. G. M. Levette of the State Geological Survey of Indiana, in a hydrographic survey of a dozen or more of the lakes in the northern part of that state, where his experience in the collecting and preservation of specimens of natural history and in seining and dredging was of great value.

About a year after its organization in 1869, the Salem Fraternity first attracted Mr. Cooke's attention. He soon became one of its most helpful friends, and more and more he took into his willing hands multiplying activities. He was interested in the formation of the library and reading room, becoming chairman of the committee on these departments and constantly and earnestly devoting himself to the welfare of this institution. He possessed admirable traits of character. No one could take more pains

to confer a favor than he even to the humblest of the boys. He was a useful man in the line of his specialties.

Resolutely following up his work to the last, refusing to listen to the suggestions of rest or medical advice till it was too late, he sank rapidly to his death, which occurred on the fifth of June, 1880.

In behalf of the trustees, I accept this noble tribute to his memory, and tender to you, the representative of the contributors and of those who took the charge of this work, their sincere thanks. It will always have a suitable place on the walls of their building.

May it be an incentive to others to take up his mantle and go and do likewise in the advancement of all in education, knowledge and general culture.

Rev. E. B. Willson being called upon by the presiding officer as connected with the Salem Fraternity, of which Mr. Cooke had been an active member, said:

Mr. Cooke's long-continued and valuable work as a sincerely devoted manager and helper, in carrying on the several departments of the Salem Fraternity, was always a gratuitous service, given cheerfully and without solicitation. He was the one who came when others staid away: day or evening. He had great influence with the boys and young men. He knew how to control with vigor, yet with kindness and justice, the sometimes rather turbulent crowd which resorts to the amusement room of the Fraternity of a winter's evening. He hated cant and all the affectations of a busy and pretentious benevolence; would not hear praise or commendation of himself; believed in showing whether or not he was a friend of his kind by what he did, and not by speech.

The Fraternity lost its right hand when he died. Its counselling intelligence lost, too, in him some of its best practical wisdom: that wisdom that comes primarily from a hearty interest. In him was an unwearying willingness to plan and to work for the objects which this association seeks to accomplish. He believed in it wholly. He saw in its methods the best, perhaps the only, way to deal with a class of persons especially exposed, especially unprovided for in the general social and educational arrangements of the day, and equally endangering society in the future, if unconsidered now.

If any should be kept in remembrance, and should have commemorating tablets set up as memorials of their rare qualities and services it is such as he.

The Chair referred to Mr. Cooke's love for nature and the enjoyment he always took in collecting the earliest flowers at spring, and called upon Mr. W. P. Andrews as one of the friends who had frequently accompanied him at such times.

In response, Mr. Andrews said:

He had but one word to add to the just and discriminating estimates of Mr. Cooke; and that was as to his non-observance of religious forms and ceremonies, and the fact that he was never to be found inside a church on Sunday morning. This arose not from depreciation of the value of any sincere religious conviction; for Mr. Cooke's life was sincerity itself, and he was quick to recognize any good in the world; but rather from his deep feeling for our common mother Nature, who spoke to him in tones which made the efforts of the average preacher and congregation seem tame and cold in comparison.

To one who is always conscious of the lofty harmonies of the universe, the confinement of a meeting house, and the somewhat labored requirements of stated devotion, are often less a help than a hinderance to real adoration. Above all things Mr. Cooke was real and true to a remarkable degree; and if he was careless of the outward formulas of worship, the best and most genuine of his clerical friends have borne manly testimony to the fact, that his whole life was an act of devotion. "While we preached the Christ and him crucified, he lived the Christ life," said one of the five ministers of the Gospel who attended the funeral of this unobtrusive, humble worker; and the statement sums up Mr. Cooke's being, which was indeed a perpetual prayer; unuttered by the lips,— for he made no outward professions of any sort,— but *acted* in his unconscious daily existence. Could he help the needy in mind, body or estate, there was his service. Could he assist a friend in any work or pleasure, there was his hymn of praise. And nothing could daunt him unless it was the expectation of some acknowledgment of gratitude, from which he shrank as hastily as most men seek reward here or hereafter for the good they have done.

His life was undoubtedly shortened by his untiring devotion to the charity with which his name will be forever associated; and almost his last strength was spent in giving pleasure to a friend's children, whose sunny natures always found an answer in his own unselfish child-heart. The lovely arethusa, which they had gaily plucked together on the last Sunday morning he was with us, bloomed on unwithered, when his own outward form was returned to the Great Mother whose gentle spirit blossoms anew in the sweetness and purity of his own.

Careless of forms, and all our casual creeds,
Known truly but to nearest friends, and few;
He simply asked: "What is there I can do
For others?" heedless of his own scant needs.

He led the Life that every pulpit feeds,
Though ne'er the pastors found him in a pew:
Yet one said: "Brother, many years we two
Have preached The Christ;—he made our *words* his deeds."

Pure Soul! not for himself he spent his might,
And humbly learned his Mother Nature's lore,
Roaming a child, with children, by her side.

Leal-hearted Comrade! not for him came night;
Rather for us who took the flowers he bore,
The flowers still fair, though he, good man, has died.

The Chair then read several letters which had been received from persons at a distance, and those nearer home who were prevented from being present on the occasion and which are referred to below:

CAMBRIDGE, MASS., Jan. 12, 1883.

Were it not that I have been confined to the house for several days by a severe cold, I should be with you this evening to join in the well deserved tribute to the memory of Caleb Cooke, my friend and associate for so many years.

He was a faithful worker and officer in the Institute and Academy, and to his quiet and unostentatious labors far more is due in developing the wide-spread interest in local natural history pursuits, for which Essex County has become noted, than his peculiar character and habits would lead the superficial observer to suspect. His singular life, with its many deep undercurrents of thought and action, was only understood during his lifetime by a few who had long been associated with him, although his good works have been acknowledged since his death. I am personally thankful that the memory of my friend is to be perpetuated by the tablet to be presented to the Academy this evening, and it seems to me that the Board of Trustees

will never be called upon to accept a more honorable trust than its perpetual care.

Regretting that I cannot be present at the ceremony of presentation,

I remain,
Yours very truly,
F. W. PUTNAM.

PROVIDENCE, R. I., Jan. 17, 1883.

I received your postal card in reference to the dedication of the memorial to Caleb Cooke, and being much occupied with sickness in my family did not answer it at once, supposing that the exercises would not take place immediately. I regret exceedingly that I did not send a letter at once to be read on the occasion with the others. I had a peculiar regard and affection for our departed friend. His unselfish devotion to his friends, his zeal for science and the very many unostentatious services he rendered to those working upon scientific subjects, as well as the hearty and wholesome manner in which he labored for the Essex Institute and Peabody Academy of Science, as well as the Salem Fraternity, are deserving of the permanent record which has been made.

Yours very truly,
A. S. PACKARD, jr.

It is with regret that I am unable to accept your kind invitation to attend the presentation of the Caleb Cooke Memorial to the Trustees. I venture to send a word of tribute which you may hide away with your account of the evening's exercises; it is simply the word of a witness who knew him not only in the work of the Summer School and the Essex Institute, but through his generous regard for children.

Kind hands erect this Tablet
To the memory of one,
Whose hand was ever ready
To assist his fellows,
Whose heart was kind and tender
As a child's; as loyal and true
As any knight of old;
Simple and unpretentious,
Yet great, because *himself;*
Honest, upright, sincere,
Such was the man we honor,
He lived and labored *here.*

Yours cordially,
KATE TANNATT WOODS.

SALEM, Jan. 12, 1883.

GRAND RAPIDS, Jan. 14, 1883.

I wish to express my thanks that I am still remembered in Salem, and especially that I am identified as a friend of the late Caleb Cooke.

I know nothing of the circumstances connected with his death — simply that he is gone, and I feel the deepest sorrow that this must be.

Mr. Cooke was the first person, belonging to the Peabody Academy of Science, who welcomed me when I reported myself as a student for the summer class of 1876, and his cordial, earnest greeting gave me a feeling, at once, that he was to be among those who would take an interest in my welfare. Mr. Cooke had many opportunities that season to extend friendly services, and special acts of kindness, for which I shall always feel grateful.

I am glad this "Memorial Tablet" has been placed in the building, which must have been dear to him from long association.

These few lines are prompted by a warm regard, and deep feeling of respect for the one whose memory you have so appropriately honored.

Yours very truly,

MRS. GEO. C. FITCH.

After several other letters together with the above had been read, the company passed to the hall to examine the tablet which had been unveiled.

At the close of the exercises a collation was served in the library, after which the party adjourned.

NOTE.—The accompanying heliotype illustration of the memorial tablet is from a photograph made by Mr. Andrew B. Cross of Salem, under a Thomsom-Houston Electric light of 2,000 candle power, kindly loaned for the purpose by the Salem Electric Lighting Company.

# SELISH MYTHS.

By W. J. Hoffman, M. D.

## Introduction.

The accompanying stories were obtained from the Flathead, or, more properly speaking, Selish Indians, consisting of one of the tribes composing the eastern division of the Selish linguistic stock, and who occupy the Jocko Valley, in Montana, at the eastern base of the Rocky Mountains. The Selish, as well as all other native tribes, are extremely fond of passing the long winter evenings in story-telling, and to attempt to record the events of one evening would be an arduous task. A few myths have been selected for this paper, and for the purpose of illustrating the language, as well as the syntactical structure, but a single narrative is submitted in the original text. It is proper to state that these Indians, when speaking of the various animals and birds and their participation in various transactions and exploits, do not look upon them in any other light than that of human beings who lived in remote times. One reason why we hear such expressions as "A Panther married a Salmon," or "The Bear killed the Gopher," is because an individual named "The Panther" married the daughter of another called the "Salmon;" though generally, these names are not personal names but relate to the gens or clans of which the respective persons were members. According to tribal laws, no one is permitted to marry within the gens, but always selects a partner from without, the gens being considered consanguineous and descendants from a common ancestor.

In the following text I have adopted phonetic orthography, adding two characters to express sounds not readily reproduced in English, viz.:

$\chi$, the sound of the German *ch* in *nacht*, the Arabic *ghain* or Spanish *mujer;* *q*, being equal to *ch* in German *nicht*. This is a softer sound than the preceding which is coarse and guttural.

| | | | |
|---|---|---|---|
| Sĕn′-tshĕ-lē′ | | | kō′-tump't. |
| [of the] Coyote | | | Story. |
| Sĕ-huist′-tsĕn'tshĕ-lēp | | [and] | ō-wĕ′-tshĕs |
| He was walking, the Coyote | | | he saw |
| skō-lē′-pĭ* | tō-ō′-sĕ, | | hui′-huē-iu′; |
| they were cooking | eggs, | | many animals and birds; |
| s'ā-a-tsu′*q*ts | wē-titsht′ | | es-tsī-ă′ |
| he looked | while they went to sleep | | all of them |
| u-*q*ŏl′-lŭ sĕn′ -tshĕ′-lē′ | | [and] | t'l′-kĕn-tēs′ |
| he went the Coyote | | | removed the dirt [from the eggs]. |
| t'lŭs-kăl-ēp′. | U-il′-*q*īs | | tsūs′-pĕn-ōs; |
| from the cooking place. | Then he ate | | everything; |
| o-ko-ĕs′ | l'hui′-hue-u-*q*l's | [and] | ē-huĕ′-u-*q*l'sts |
| [then] he took | the little bird† | | he pulled [crosswise |
| $\chi$'lus′-pē-lĕm′-tsīs; | o'k-tsō′-tsĭs | [of] | $\chi$lūs′-ĕn'k-tsū′; |
| the bill; | he pressed [the head | | the Lynx;‡ |
| sō′-tūmst | sō′-pŏt | [of] | $\chi$lŏs′-*q*tī-sŭ′-mĭ-ĕ; |
| he pulled [stretched] | the tail | | the Panther;¶ |
| o-wĕ'wĭ′ | kwa′-wĭ-li$\chi$lts′ | | $\chi$lŏs′-tshi-tshi-ma′-u*q*ts; |
| the Meadow [Lark | yellow breast | | the breast he made; |

| | | |
|---|---|---|
| ō-huīst′-χlu′ | sĕn′-tshĕ-lē′ | tshĭl-kūt′ |
| he walked away | the Coyote | a short distance |
| χlăk′-tshĭlsht | [and] | wĕ-χ′l-stla′-χlsht. |
| he sat down | | he looked at them. |
| Kă-liqts′ | | χlu-hui′-huē-χults. |
| They awoke | | all the birds and animals. |
| Sē′-tsĭsh-tshēl′, | | ha′-χlĕ |
| What is the matter, | | already |
| klē′-kĕ-o′-vĭ-tsĕ | | ū′-kĕ-tĭtsh′? |
| we ate all | | before we went to sleep? |
| Wē′-kŏl-kwĕ′-tshi-nă′, | | ta′-sĭn-sō-huī′-nĕ-mĭn-tēm′. |
| Talked one, | | they could not understand him. |
| Kwēmt′-po-mĭn-tsūqt. | | |
| Then they all scattered. | | |

## THE COYOTE AND THE MUD-HEN.

The Coyote was one time compelled to hunt for food, and while strolling along the shore of a lake, observed a great variety of water fowl only a short distance from land, but still too much exposed to be approached without detection. He found some broad leaves growing in the water, took a quantity of them with which he covered his body, and crawled slowly along the edge of the water to the point opposite, and nearest to, the birds. The Swan caught sight of the Coyote as he was approaching and called out to him, saying, "Coyote, what are you doing with that load on your back?" to which the Coyote replied, "That is my music." "That is queer looking music," said the Swan, "let us hear your song, so that we may learn to know your voice." "I cannot do it now," the Coyote replied, "but if you will come to my lodge this evening, which I shall build here on the bank, I will sing for you and we can have a dance." The birds agreed to come, and

the Coyote immediately left and began to erect his lodge, securing all the coverings and closing all the small openings so as to prevent the escape of any one within, except through the doorway.

After sunset the birds began to arrive, entered the lodge and took their places around the fire. When all had come, and the lodge was full, the Coyote said "Now we will have to put out the fire so that none of us get burnt by treading on the hot coals." The fire was then extinguished, when the Coyote took his place at the door, telling the birds to dance around in a circle while he sang for them. The Coyote sang, and the birds danced, passing around and by the door where the Coyote was stationed where he grasped the birds, rapidly as possible, by the necks which he broke, throwing the bodies on the outside. After a while one of the Ducks said, "Where are all our dancers, I hear but a few? light the fire so that we may see what is going on." Then the Coyote built another fire that he might catch the other birds, but when they saw their companions lying dead on the outside of the lodge, they cried out that they were being exterminated, and made a rush for the door, the last one to leave being the Mud-Hen, and as it stooped to pass through the door, the Coyote kicked it on the legs so that the joints protrude awkwardly toward the tail even to this day.

The Ponkas have a myth somewhat resembling the above, but which has reference to a change of the color of the eyes of the Turkey, which corresponds to the Dakota myth relating to a similar change in the color of the eyes of the Wood Duck.

### HOW THE LYNX GOT HIS BROAD FACE.

There was a great chief, the Panther, who had a beautiful daughter. One day there was a gathering of the whole tribe when each animal tried to obtain her for his

wife. The Bear proposed to the Panther for his daughter, but he would not listen. The Rabbit also tried, but in vain, as did all the others. When night came on, the Lynx sat thinking, when all at once the thought came to him that he might behold the Panther's daughter, even if he could not marry her, whereupon he left his own lodge and proceeded to that occupied by her. Then he carefully crawled upon the lodge and looked down through the opening left for the smoke to issue, where he saw the Panther girl asleep, with her mouth wide open. The Lynx sat in wonder looking at the beautiful girl, and while he was panting from the exertions in ascending the lodge, some saliva dropped down into her mouth, which caused her to have a child, in due time, which could not be stopped from crying.

The Panther Chief tried to quiet his grandchild, but could not; the daughter tried, but failed, as did all the rest of the Panther's family. No one could be found who could be chosen as the father of the crying child. Then the Panther Chief called together all the young men of the tribe, and said, "Go you, all of you, and try if you can quiet my Grandchild, and the one in whose embrace it ceases to cry, shall be the father of my Grandchild and the husband of my daughter." Then the Bear tried to quiet the child but could not; the Rabbit tried and failed; and all the rest of the young men met with no success. The Coyote came last, and when he took up the child it became quiet at once, when the Panther Chief said, "Coyote, the child is yours, and you must take my daughter for your wife." This was as the Coyote desired, but when he attempted to take his wife away, all the young men, who had been repulsed in their previous attentions to the Panther girl, set upon the Lynx and beat him to death and scattered the pieces.

Then the tribe moved off to a distant camping place, leaving the Panther girl with her child and murdered husband to themselves. Then from the pieces of the Lynx lying about, came a voice directing her to place them together as well as she could and to set the mass in a corner of the lodge, and to cover it with soft robes where it should remain for five days. The wife did as she was told, and sat despondently in the lodge waiting for the time to elapse when she could again have her husband restored to her. On the third day, the wife, who had become very lonely, approached her husband and asked, "May I remove the robes to look at you?" "No," responded the Lynx, "wait two days longer and I will be well." Then she pressed the robes closely about him and pressed them upon his head to keep him warm. On the fourth day, the wife again approached the corner in which her husband was, and said, "May I remove the blankets and take you out, I am very lonesome?" "No," responded the Lynx, "wait one day longer and then I shall be quite well." On the morning of the fifth day, the Panther again approached the Lynx and said, "May I remove the blankets and take you out, I am so lonesome that I can wait no longer?" but before the Lynx could reply that the day was not yet over, she had removed the coverings to liberate her husband, when he immediately came forth, but his face was still broad and flat from the pressure of the blankets put upon it, and so it remains to this day.

In the meantime the tribe, who had removed from the old camping ground, had suffered much from want and privation. Many had starved to death, and many more were dying. The Magpie happened to return to the old camp one day, and found that the Lynx and his family had all the meat they could eat; in fact they had so much that everything was greasy with the fat that had been thrown

from the lodge. Then the Magpie gathered up a great quantity of meat, returned to his camp and fed the tribe. The Panther Chief then said, "Where did you find meat, we have none in our country?" "I went hunting," answered the Magpie, "and killed some game." The other hunters now demanded the truth, as they did not believe the Magpie's story.

Then the Magpie narrated his journey to the old camping ground, saying "the Lynx and his family have all they can eat. They have all the meat they can want, and more too, in fact they have so much that everything in their camp looks greasy." "Then we shall return to them," said the Panther, "get you everything together that we can take with us and let us leave at once." After all were ready to leave, the Panther said, "come, let us start for our old home," and they set out. After a long journey, the tribe came in sight of the lodge owned by the Lynx, and soon every one was glad, for the Lynx and his wife came out of the lodge and welcomed them back.

### HOW THE RABBIT HAD HIS LIP CUT.

One day the Rabbit happened to visit a neighboring camp, where he saw a beautiful girl with whom he immediately fell in love. He at once started to catch her, but she ran very fast, and the faster the Rabbit ran in pursuit the faster went the girl. The young men of the tribe, seeing a stranger chasing their favorite, immediately gave chase, and when they got near enough, began to throw stones and clubs at the Rabbit, until finally one young warrior hurled a club which hit the Rabbit below the nose slitting the upper lip, which has not healed to this day.

### THE COYOTE AND THE FISHES.

The Coyote one day stood upon the bank of a large river in which he saw many white fish swimming about. Then he said to them, "Go, tell your people to come to

my lodge which I shall build here on the bank, and to play with me. I shall look for you to-morrow." The fish said they would go, and immediately disappeared in deep water. The Coyote was a great gambler, but did not suppose the fish would be able to come on land, still, he built a lodge as he had told them he would do. Next day great numbers of all kinds of fishes came swarming from the river and entered the Coyote's lodge. Then they began to play, and played until the Coyote had lost everything he owned, even his clothing.

When the Fishes were ready to go, one of them said, "Coyote, come and see us under the water to-morrow, and we will play again." The Coyote said that he would come, though he knew he could not go under the water, neither did the Fishes believe that he would come. Then the Coyote went away very sad, when the Fox, his cousin, met him and said, "Brother, why are you so sad?" "I am sad," replied the Coyote, "because I lost everything I owned yesterday while playing with the Fishes. I cannot recover the things, although they invited me to come and play with them to-day." Then the Fox said, "if that is all, I will take you under the water, and we can go now;" so the Fox took his pipe, put the Coyote into the bowl and covered it with clay. Then the Fox got into a canoe and paddled out into deep water, when he jumped overboard and sank to the bottom, where he took the Coyote out of his pipe, and they started to visit the camp of the Fishes, which they soon found.

The Coyote then began to play with the Fishes, and continued gambling until he had recovered all he had lost the day before, and had won everything from the Fishes that could be carried away. Then the Fox again put the Coyote into the bowl of his pipe, ascended to his canoe, and returned to the shore where he liberated his cousin, the Coyote.

## THE COYOTE AND HIS NEIGHBORS.

The Coyote had five sons with his wife, and lived in a lodge a great distance from any other habitation. One morning he took his youngest son and started to visit the Elk, who also had five sons. When, after a long journey, they arrived at the Elk's lodge, they found it empty and no signs of anything to eat. Then the Coyote said to his son, "I do not like this, not having anything to eat after such a long walk." Soon the Elk returned and after welcoming his visitors, stooped and picked up a sharp stick with which he began to tear open his hips to dig out some Kamass roots. The Elk then said "Eat some Kamass roots, they are very good; I always provide myself in this way when I am away from home and get hungry." "What," said the Coyote, "do you expect me to eat dung?" "That is not dung," said the Elk, "but Kamass roots." Then the Coyote picked up one of them, and after nibbling at it cautiously, discovered it to be very good, whereupon he and his son filled their bellies with Kamass.

When the Coyote was about to depart, he said to the Elk, "Come and see me to-morrow, and see how I live." "Yes," responded the Elk, "I will come to see you to-morrow."

Next morning the Elk took his youngest son and set out for the Coyote's lodge which he reached after a long journey. After the Elk was welcomed, the Coyote took a sharpened stick, as he had seen the Elk do, and commenced to tear his flesh in a painful manner, when the Elk cried, "Stop! stop! do not tear yourself so; I do not think you ever tried that before. It is *my* practice always to do that when I am away from home and get hungry, so let me provide the Kamass roots this time." "That is just what I wanted you to do for me," said the Coyote, and handing the stick to the Elk, they soon had enough Kamass for all,

and after they had filled their bellies, the Elk and his son left for home.

Next day the Coyote said to his youngest son, "Let us call on our neighbor, the Bear, and see how he lives." So after telling his wife of his plan, the Coyote and his son started, and after a long journey, reached the Bear's lodge. Then the Bear welcomed his visitors, when the Coyote said "I do not see anything to eat, and we are hungry after our long walk." The Bear then got down a large knife, and after sharpening the edge against another stone,[1] walked up to his wife and, grasping her by the hip, cut out some large slices of meat, which was soon broiled on the coals and served. The Bear then took up a handful of earth which he rubbed over the wound on his wife's hip, when it instantly healed and was covered with hair as before. Then the Bear said, "This is the way I always provide myself with meat when I am away from home and get hungry." After they had all filled their bellies with Bear's meat, the Coyote rose to go, and said, "Bear, come and see me to-morrow, and see how I live." "Yes," responded the Bear, "I will come and see you to-morrow."

Next morning, the Bear with the youngest of his five sons, called at the Coyote's lodge and was welcomed. After a short time the Coyote arose and got a knife, which he sharpened on another stone, as he had seen the Bear do; went up to his wife, grasped her by the hip, and cut her almost to pieces during which she screamed with pain. Then the Bear cried, "Stop! stop! why are you doing that? I do not think you ever tried that before. It is *my* practice always to do that when I am away from home and get hungry, but you have never tried it before." Then the Bear took the knife and cut a large quantity of meat from

[1] It is evident from the use of this term that stone knives were used at the time to which the myth relates.

his own hip, after which he took up a small handful of earth, rubbed it upon the wound, which healed instantly and was covered with hair as before. "That is just what I wanted you to do," said the Coyote. After the piece of meat had been broiled on the coals, they all ate until their bellies were full, when the Bear arose and started for home.

On the next day, the Coyote took his youngest son, and started to visit the Kingfisher, who lived at a very great distance. They were both very tired and hungry by the time they reached the Kingfisher's lodge, but, when they had been welcomed, they were pleased to see preparations for something to eat. The Coyote was astonished to see how the Kingfisher and his family all had their hair arranged in top-knots, but said nothing. The Kingfisher told his youngest son to collect some willow poles and to erect a platform on the top of the lodge, which he immediately proceeded to do.

Then the Kingfisher flew to the top of the lodge, which was located near the river, and after watching a small opening in the ice for a short time, suddenly flew toward and into the hole, disappearing under the water. Soon he returned bringing a fine large fish in his mouth, which was broiled on the coals and served. After they had all filled their bellies with fish, the Coyote arose to go and said, "Kingfisher, come and see me to-morrow, and see how I live." "Yes," responded the Kingfisher, "I will come and see you to-morrow."

Next morning, the Kingfisher and his youngest son started to visit the Coyote, whose lodge they reached after a very long journey. The Coyote had been very much occupied all the morning in tying his children's hair into little tufts on the tops of their heads; when his wife said, "What are you doing with the children's heads?" "Oh,"

replied the Coyote, "I am only doing honor to the Kingfisher who is coming to see us to-day."

The Kingfisher was welcomed, and the Coyote, thinking it time to have something to eat, called to his youngest son and said, "Go and gather some willow poles and erect a platform on the top of the lodge," which he immediately proceeded to do. When it was finished the Coyote ascended the lodge, crawled on top of the platform, and jumped off into the river, but the water being covered with ice, he almost crushed his head and lay some time badly hurt. The Kingfisher, though too late, cried, "Stop! stop! why are you doing that? I do not think you ever tried that before. It is *my* practice always to do that when I am away from home and get hungry, but you have never tried it before." Then the Kingfisher broke a hole in the ice, ascended the platform and so dived into the river, soon returning with a fine large fish, which was soon broiled on the coals and served. Then they all ate until their bellies were full, when the Kingfisher and his son returned to their home.

After this, the Coyote continued to hunt his food as he had been taught by his forefathers.

## THE SALMON AND THE WOLF.

The Panther's youngest daughter was a very beautiful girl, whom all the young men of the tribe desired to marry, but whose offers the Panther refused, one by one. To avoid the necessity of constantly refusing these applicants, the Panther said, "Any one who will break my Elk-horns shall have my daughter." This news soon spread to neighboring camps, and a day was set for the trial of breaking the "magic" Elk-horns. The Bear came forward, grasped the horns and crushed them into small pieces, but when

he threw them upon the ground they immediately flew together and the horns were entire, as before. Then the Rabbit took the horns and crushed them, but he had no sooner thrown them upon the ground than the pieces had again united. Then the Lynx tried, and the Coyote, and all the rest of the young men present.

The Salmon had heard of the beautiful daughter of the Panther, and decided to try to obtain her, so he brought with him two friends, the Kingfisher and the Blackbird.[2] The Salmon lived upon a large river at a great distance from the Panther's village, and he did not reach that place until all the young warriors had failed in their trials for the Panther's daughter.

The wolf,[3] who lived far to the south, had two elder brothers, and these three also started for the Panther's village, arriving there at the same time as the Salmon and his friends. Then the Wolf said, "Salmon, you came first, you break the horns if you can," but the Salmon refused, saying, "No, Wolf, you came before I did, you break the horns if you can." Then the oldest Wolf tried, broke the horns, but they immediately became whole again when thrown upon the ground. Then the next wolf tried, but with no better luck. The Wolf whose trial now came was a Shaman,[4] and felt sure of winning the girl, so he picked up the horns, broke them into small pieces, but when he threw them upon the ground they slowly united as before. Then the Salmon came forward, took the horns, broke them into small pieces and threw them upon the ground where they remained and did not unite again. Then

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[2] This Blackbird is said to have peculiar eyes and habits, and evidently signifies the *Pipilo megalonyx*.

[3] *Canis occidentalis*, commonly known as the Grey Wolf.

[4] Improperly termed "Medicine Man."

the Panther said, "Salmon, you broke the horns, you take my daughter for your wife." Then the Salmon took the Panther girl under his arm and with his companions, started for home. They had not gone far, before the Wolf and his elder brothers followed the Salmon and began to fight. They fought two days and two nights, during which time the Salmon and his friends gradually worked their way toward the river. On the third morning, just as the Salmon reached the bank of the river, the Rattlesnake, who lived on the opposite shore and who was a cousin to the Wolf, came out of his lodge, and seeing his cousin the Wolf fighting, took an arrow and shot it at the Salmon striking him in the side of the neck. The Salmon fell down near the water's edge, while his friends were compelled to leave because the Wolf and his elder brothers came and took away the Salmon's wife and went home.

The fishes came and threw water on the Salmon, which kept him alive, and after a while he worked his way into the water and swam down to the Fish Hawk's camp. The Fish Hawk welcomed the Salmon and healed his wound, though he remained there a whole year.

When the summer came again, the Salmon said to the Fish Hawk, "Fish Hawk, when you fly away from home, do you ever see anything of my enemy, the Wolf?" "Yes," said the Fish Hawk, "I see him sometimes; he is a great hunter and kills many deer." Then the Salmon took the arrow with which he had been wounded, and set out to visit the Rattlesnake, who lived in a grass lodge. When the Salmon came near the lodge he listened and heard the Rattlesnake singing, telling how he killed a great Shaman, the Salmon, and gave the Wolf the victory. Then the Salmon went nearer to the lodge, coughed so as to attract the Rattlesnake's attention, when the Rattlesnake peeped

out to see who was coming. When he saw the Salmon he was much surprised, but came out and pretended to welcome him, saying, "Why, Salmon, I thought you had been killed last year, and I have been singing your death-song, and telling my friends how sad I was." Then the Salmon laid down the arrow with which the Rattlesnake had hit him, saying, "Rattlesnake, is this your arrow?" "Yes," said the Rattlesnake, "where did you find it?" "I found it down on the shore." "Oh!" replied the Rattlesnake, "I lost that yesterday while shooting ducks, I knew that it must have fallen somewhere, but could not find it." Then the Salmon said, "Give me some hot coals, Rattlesnake, I want to mend my boat with pine gum before I leave this place." Then the Rattlesnake brought out some hot coals, which the Salmon took and set the grass lodge on fire, and as the Rattlesnake was burning, said to him, "Rattlesnake, hereafter when more people come into your country you must not bite them with your arrows, but they must kill you wherever they find you or your people." Then the Salmon left and travelled a long distance when he saw the Wolf's lodge. He crawled up very slowly and found the Wolf's wife alone, but guarded by the Louse and the Flea. Then the Salmon said to the Louse, "I am the husband of the woman in that lodge, and if you will assist me I will give you the Wolf's head for your share," and to the Flea, "you shall have the Wolf's back and rump for your share." They both agreed to accept the offer and allowed the Salmon to enter the lodge. Then the Salmon and his wife planned how they should destroy the Wolf, as well as his two brothers who lived in the lodge also. The Salmon took a sharp knife and waited. Towards evening the oldest wolf returned carrying a deer on his shoulders, which he threw into the lodge and then went

away to wash his hands. He then returned and as he put his head into the door of the lodge, the Salmon struck him over the forehead with the knife and killed him. The woman then dragged the body back into the lodge where she covered it with robes.

Soon the next Wolf came, having a deer upon his shoulders, which he threw into the lodge and then went to the spring to wash his hands. He then returned and as he put his head into the lodge, the Salmon cut off his head. The woman then dragged the body into the lodge and hid it with the body of the oldest Wolf.

After a long time the youngest Wolf, who was a Shaman, returned with a deer upon his shoulders. His magic power enabled him to know that the Salmon was in the lodge, and he called out, "Salmon, come out of my lodge, I know that you are there and want to kill me; come out that I may fight you." The Salmon did not answer, and the Wolf came closer and again called out as before. The Salmon remained silent; when the Wolf came up and threw the deer into the lodge and went to the spring to wash his hands. When he again came toward the lodge, he said, "Salmon, I know you are in my lodge and want to kill me; now come out and fight me." The Salmon remained quiet, but after a short time asked the woman if the Wolf did not possess some charm or sacred rattle, by which means the Wolf could be induced to enter the lodge. The woman said that the Wolf had a rattle which, if used, would probably bring him in; whereupon she took it down and began to use it, at the same time telling the Wolf to enter the lodge, as she was going to throw the rattle into the fire. The Wolf then came nearer but would not enter until he saw her throw the rattle upon the burning coals, when he made a leap through the door, the Salmon at the

same time striking him upon the nose and splitting his body lengthwise, one-half falling upon the floor, while the other half sprang upon the fire, grasped the sacred rattle and passed up through the smoke-hole and onward to the summit of a high mountain.

Then the Salmon took his wife, and after giving the heads of the wolves to the Louse, and the backs and rumps to the Flea, returned to his own home.

There was a village near the base of the mountain upon which the Wolf took refuge, and every night the people could hear him howl. Then the Coyote said, "I wonder what can be wrong with the Wolf, he is crying so much." Then several of the people went to find the Wolf's lodge to take him some food, but he could not be found. Soon, people were attacked by the Wolf at night, and so many were killed that the Chief said, "Let us move away to another camp, if we stay here we shall all be killed." Then the Coyote said "You must all go, but let me remain, I will kill the Wolf." The tribe then moved away and the Coyote, who was a Shaman, transformed himself into a little boy. He dug a pit in the ground at the bottom of which he placed a log of wood, which he transformed into a dead man. Then the Coyote sat at the mouth of the pit and cried. When the Wolf heard a child crying, he came down from the mountain and, seeing the little boy, said, "Coyote, I know that is you, what is the matter with you?" But the Coyote only cried the harder and pointed down into the pit. Then the Wolf approached and asked, "Is that your father?" when the Coyote assented by nodding his head and crying still louder. Then the Wolf jumped into the pit, which the Coyote at once caused to sink deeper and deeper, so that the Wolf should not escape. The Coyote then took his knife and, as the Wolf jumped

up the sides of the pit to make his escape, the Coyote thrust the blade into the Wolf's head and killed him. The pit was then filled with dirt and leaves, and the Coyote returned to his camp, summoned his people to return, which they did; and there they still live in peace.

NOTES.

*Skō-lē'-pĭ. This signifies cooking in a depression in the ground, similar to the method adopted in preparing Kamass roots in the northwest, and mescal roots in Arizona. Hot stones form the floor of the pit, upon which the roots are laid, and covered with a layer of stones, earth, grass, etc.

† l'hui'-hue-u-*q*l's. The Cross-bill (*Curvirostra Americana*). It is said that at this time the bird had his mandibles distorted, which rendered his speech unintelligible to the others.

‡ χlŭs'-čn'k-tsū'. The Wild cat (*Lynx rufus*) frequently called Lynx, by the Indians. The word for the latter is sĭn'-χŭ-tsō'. This act of the Coyote is supposed to account for the flat face of the animal.

¶ χlŏs'-*q*tī-sŭ-mĭ-č. The Panther (*Felis concolor*) is said to have received his long tail at this time, having previously been a Lynx (*L. Canadeņsis*).

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# THE JESUITS.[1]

BY GEORGE H. HOSMER.

MR. HOSMER first spoke of the Romish church previous to the year 1500; of the corruption in the church and of the vast treasures poured into Rome by the immense number of persons flocking to the eternal city. St. Peter's was commenced and partly paid by this treasure. The Reformation under Martin Luther was next briefly traced, and the excitement caused by the protest of 1517 by Luther against the sale of indulgences. In 1491 Ignatius Loyola, the founder of the Society of Jesus, was born. He was of royal family and soon became famous as a bold and chivalrous gentleman and soldier, displaying great valor in war. In 1521, he suffered from a long and painful illness, the result of a wound, during which time he became interested in reading the lives of the saints and his thoughts were directed towards a religious life. From

[1][An abstract of a paper read at a meeting Monday evening, April 2, 1883.]

an active life in the field and from the emoluments of the court and camp, he turned his future to the austerities of the monastery and devoted himself to the formation of the Society of Jesus and the propagation of its doctrines throughout the world. With Peter Faber, Xavier and five others, the society was founded and missionary work commenced. After varying fortunes the Pope recognized the order, Loyola having been chosen supervisor. The society spread and became a power, and while Loyola lived it was for good; after his death the Jesuit order became corrupt as it grew in wealth and influence.

This year (1883) is the two hundred and fiftieth anniversary of the settlement of the Jesuit order in America. Marquette came to America and preached from the St. Lawrence to the Mississippi river, which last he is said to have discovered. The Jesuits also accompanied Lord Baltimore to Maryland in 1632. There were, in 1874, seventeen Jesuit colleges in the United States, and the sect numbered about 1062 persons.

## Annual Meeting, Monday, May 21, 1883.

The annual meeting this evening at 7.30 o'clock. The President in the chair. Records of the last annual meeting were read and approved.

The reports of the Secretary, Treasurer, Auditor, Librarian, and the Curators and Committees were read, and duly accepted and ordered to be placed upon file.

Mr. T. F. Hunt, chairman of the committee upon nominations, reported the following list of officers, which was duly elected. Messrs. T. F. Hunt and F. Israel having been requested to collect, assort and count the votes.

# OFFICERS ELECTED.

**PRESIDENT:**

HENRY WHEATLAND.

**VICE-PRESIDENTS:**

ABNER C. GOODELL, JR. — DANIEL B. HAGAR.
FREDERICK W. PUTNAM. — ROBERT S. RANTOUL.

**SECRETARY:** GEORGE M. WHIPPLE.

**TREASURER:** GEORGE D. PHIPPEN.

**AUDITOR:** RICHARD C. MANNING.

**LIBRARIAN:** WILLIAM P. UPHAM.

**CURATORS:**

*History*—HENRY F. WATERS.
*Manuscripts*—WILLIAM P. UPHAM.
*Archæology*—FREDERICK W. PUTNAM.
*Numismatics*—MATTHEW A. STICKNEY.
*Geology*—B. F. MCDANIEL.
*Botany*—GEORGE D. PHIPPEN.
*Zoölogy*—EDWARD S. MORSE.
*Horticulture*—JOHN E. PEABODY.
*Music*—JOSHUA PHIPPEN, JR.
*Painting & Sculpture*—T. F. HUNT.
*Technology*—EDWIN C. BOLLES.

**COMMITTEES:**

*Finance:*

The PRESIDENT, *Chairman ex off.*

HENRY M. BROOKS. — GEO. R. EMMERTON. — DAVID PINGREE.

The TREASURER, *ex off.*

*Library:*

CHARLES W. PALFRAY. — HENRY F. KING. — WILLIAM NEILSON.
WILLIAM D. NORTHEND. — THEODORE M. OSBORNE.

The LIBRARIAN, *ex off.*

*Publication:*

EDWARD S. ATWOOD. — ABNER C. GOODELL, JR. — EDWIN C. BOLLES.
H. F. WATERS. — JAMES A. EMMERTON. — T. F. HUNT.

*Lecture:*

ROBERT S. RANTOUL. — FREDERICK W. PUTNAM. — AMOS H. JOHNSON.
FIELDER ISRAEL. — ARTHUR L. HUNTINGTON.

*Field Meeting:*

The SECRETARY, *Chairman ex off.*

GEORGE A. PERKINS, Salem.
GEORGE COGSWELL, Bradford.
FRANCIS H. APPLETON, Peabody.
NATHANIEL A. HORTON, Salem.
EDWARD S. MORSE, Salem.
GEORGE D. PHIPPEN, Salem.
FRANK R. KIMBALL, Salem.
EBEN N. WALTON, Salem.
WINFIELD S. NEVINS, Salem.
JOHN H. SEARS, Salem.

RETROSPECT OF THE YEAR

compiled from the several reports read at the meeting and the remarks by several members in relation thereto, presents the work of the Institute in the various departments since the last annual meeting.

The past year has been one not specially eventful in the annals of the Institute, and there have been no important commemorative or social observances as have occurred in some of the previous years. The ordinary work of the society has gone smoothly. The various Regular and Field Meetings have been well attended. The publications have been issued with pages well filled with valuable historical and scientific papers. Our membership has held its own. Generous donations to the library, cabinet, and the treasury have been made. The number of visitors to the rooms has been large and the year may, with propriety, be called a prosperous one.

MEMBERS.—Changes occur in the list of our associates by the addition of new names and the withdrawal of some by resignation, removal from the county or vicinity, or by death.

MEMBERS ELECTED MAY 1882 TO MAY 1883.

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| 1882, | June | 20 | GEORGE BURNHAM IVES, Salem. |
| " | " | " | CHARLES F. POUSLAND, Salem. |
| " | " | " | CHARLES A. BUXTON, Salem. |
| " | " | " | FRANK A. BROWN, Salem. |
| " | " | " | JEAN M. MISSUD, Salem. |
| " | " | " | HARRIET KNIGHT KIMBALL, Salem. |
| " | " | " | HATTIE L. KIMBALL, Salem. |
| " | " | " | GEORGE RANDALL, Peabody. |
| " | Sept. | 5 | WILLIAM HENRY GOVE, Salem. |
| " | " | " | PATRICK J. MC CUSKER, Salem. |
| " | " | 19 | MYRA HALL, Salem. |
| " | Dec. | 5 | ESTHER C. MACK, Salem. |

1883, Jan. 15 Hannah L. Rantoul, Beverly.
" " " Louise Preston Dodge, Danvers.
" Feb. 5 Edmund Waters Longley, Salem.
" " 19 Lawrence Cunningham, Salem.
" Mch. 5 Benjamin F. Mc Daniel, Salem.
" " " Charles Whitney Haddock, Beverly.
" " 20 Jabez Baldwin Lyman, Salem.
" Apr. 16 Henry M. Meek, Salem.

We have received information of the decease of fifteen during the year, who have been resident members.

Oliver Carlton, son of John and Mary (Weston) Carlton, born at Mount Vernon, N. H., July 20, 1801; graduated at Dartmouth college, 1824; a well known and distinguished Principal of the Latin School in Salem for many years; taught at Francestown, in 1825; tutor in Dartmouth, 1825–6; taught at Windsor, Vt., in 1827; Haverhill, Mass., Marblehead, Salem, Portsmouth, N. H.; and again at Salem; died at Salem, June 21, 1882.— Elected a member June 21, 1848.

George Foster Flint, son of Addison and Mary E. (Foster) Flint; born at North Reading, Oct. 17, 1840; studied law in the office of George Wheatland, counsellor at law, Salem, and after admission to the Essex Bar, continued in the office, associated with Mr. Wheatland in business until his decease, which occurred June 23, 1882. He was well known as a conveyancer and examiner of titles of real estate. Elected a member Feb. 20, 1861.

Joseph J. Rider, son of Joseph and Abigail (Janes) Rider, born at Salem, June 26, 1827. Master mariner, died at Gorea, West Coast of Africa, July 25, 1882. Elected a member Oct. 13, 1858.

Albion S. Dudley, son of Edmund and Rebecca (Bangs) Dudley, born at Kingfield, Me., Aug. 6, 1816, died at Asbury Grove, Hamilton, Mass., July 12, 1882. Dentist in Salem. Elected a member May 6, 1867.

George K. Proctor, son of James K. and Lucretia (Blood) Proctor, born in Townsend, Mass., July 9, 1837, a photographer in Salem, afterwards a grocer, died at Salem July 27, 1882. Elected a member July 16, 1872.

Robert Brookhouse, son of Robert and Eliza W. (Grafton) Brookhouse, born at Salem, March 3, 1823, merchant in Salem, associated with his father and others in the West Coast of Africa trade, died at his seaside residence in Marblehead, Aug. 2, 1882. An original member.

Elizabeth Endicott (Gray) Newhall, daughter of James and Elizabeth (Endicott) Gray, born at Salem, Feb. 15, 1802; married April 14, 1829, Gilbert Grafton Newhall, merchant of Salem (see Hist. Coll. of Essex Institute, vol. vi, p. 127); died at Salem, Aug. 12, 1882. Elected a member Oct. 8, 1878.

Joseph E. Fiske, son of William and Dolly (Wellington) Fiske, born at Heath, Mass., Feb. 12, 1811. In early life, a teacher in Danvers, afterwards a practising dentist in Salem more than forty-five years, noted for his gift of invention. Died at Salem, Aug. 25, 1882. An original member.

Priscilla S. (Hodges) Clark, daughter of Jonathan and Elizabeth (Ropes) Hodges, born Nov. 4, 1799, married John Clark Sept. 4, 1821, died at Salem, Oct. 12, 1882. Elected a member June 9, 1864. Mr. Clark, son of John and Lydia (Sanderson) Clark, was born in Waltham Mar. 14, 1796, gr. Harv. Coll. in 1816; soon after graduation was teacher of a private school, in Salem, for several years; in 1824 merchant in Boston; in 1830 agent of Merrimac Manf. Co., Lowell; in 1848 Treas. Great Falls Manf. Co., place of residence, Salem, where he died Jan. 28, 1851. (See "Records of the descendants of Hugh Clark of Watertown, Mass.," by John Clark, p. 75.

Augustus Story, son of William and Elizabeth (Patten) Story, born at Marblehead, April 6, 1812, removed to Salem with his parents in 1819, gr. Harv. Coll. in 1832. A lawyer by profession, for many years President and Treasurer of the Holyoke Mutual Fire Ins. Co. Died at Salem Oct. 19, 1882. Elected a member Mch. 29, 1848.

Samuel Calley, son of William and Mary (Becket) Calley, born at Salem, April 14, 1821, a painter; mayor of Salem for the years 1872, 1881 and 1882; d. Jan. 1, 1883. Elected a member June 3, 1872.

William Whitaker, son of William and Sarah (Hariman) Whitaker, born in Haverhill, Mass., Oct. 25, 1797, came to Salem, April 1, 1823, a carpenter; died at Hamilton, Feb. 2, 1883. Elected a member Sept. 21, 1864.

Caroline Saltonstall, daughter of Leverett and Mary Elizabeth (Sanders) Saltonstall, born at Salem, Sept. 2, 1815; died at Salem, unmarried, Feb. 23, 1883. Elected a member July 6, 1864.

James Osborne Safford, son of Ebenezer and Hannah (Osborne) Safford, born in Danvers June 21, 1819, died at his residence in Salem March 18, 1883; he was largely interested in the manufacture and sale of leather; place of business in Boston. Elected a member Jan. 4, 1854.

William Henry Prince, son of John and Loisa (Lander) Prince, and grandson of Rev. John Prince, LL.D., who was pastor of the First Church in Salem 1779 to 1836, and was noted for his scientific attainments, born in Salem, Nov. 15, 1817, gr. Harv. Coll. 1838, and of the Medical School in 1841, commenced practice in Salem; Superintendent of the Northampton State Lunatic Asylum, 1856 to 1864; connected with the water-cure at Clifton Springs,

N. Y., 1870–1878; from 1878 to his decease, a practitioner in Newton, where he died May 15, 1883. An original member.

Field Meetings. These have been, perhaps, of more than usual interest and well attended. During the season four have been held.

*First* at the Middlesex Fells, Stoneham, on Saturday, June 17, 1882, by invitation of the Middlesex Institute. During the forenoon pleasant rambles were made in the vicinity of Bear Hill, a delightful spot in the Fells, the place selected for the gathering. At 2 P. M. President Dame of the Middlesex Institute called the meeting to order and extended a cordial welcome to the members of the Essex Institute. He spoke of the work and objects of the two societies and alluded to several of the historical points of interest in this locality. Mr. George E. Davenport, secretary of the Middlesex Institute, read a poem entitled "Dame Nature's Greeting." The President of the Essex Institute responded, thanking the members of the Middlesex society for the kind invitation to unite with them on this interesting occasion. Mr. John Robinson of Salem read a paper on our "native trees." Prof. Asa Gray of Cambridge, by invitation from the chair, gave some reminiscences of Darwin and his teachings, and alluded to a recent visit to him in England. Appropriate remarks were made by Mr. John H. Sears of Salem, Rev. Joseph Banvard of Neponset, Mr. Williamson of Kentucky and others. Mr. Sears spoke of the plants noticed this day; Mr. Banvard, of the benefit of these meetings, and Mr. Williamson, of the flora of his own state and that of Massachusetts.

*Second*, on Wednesday, July 12, 1882, at the Dummer Academy, Byfield, by invitation of the Trustees. This

school was organized in 1763 in accordance with the will of its patron and founder, Lieut. Gov. William Dummer,[1] under the direction of Samuel Moody,[2] its first principal, who held this position for thirty years and was a very successful teacher. During that period, the number of his pupils averaged over seventy.

A renewed effort has recently been made to restore to old Dummer its pristine glory and reputation.

Under the recently appointed head, John W. Perkins, for several years the accomplished principal of the Classical and High School in Salem, the prospects are encouraging for a realization of the sanguine hopes of the trustees and its friends, in the accomplishment of this so praiseworthy and desirable an object.

A pleasant ride by rail to Newburyport; thence by covered barges to the place of meeting, passing through a region of great natural attractiveness and rich in historic lore; a cordial reception by the trustees and Mr. and Mrs. Perkins, now comfortably domiciled in their new residence; a generous lunch at noonday; and the afternoon speaking of a pleasant character, and in general, having reference to the past history of the institution and its future prospects, with frequent allusions to those of its graduates who have well done their part in the great drama of life; will

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[1] William Dummer, Lieut. Governor of the Province, and the acting Governor 1723–28, m. Catherine, dau. of Gov. Joseph Dudley, died 10 Oct., 1761. This farm was his country seat and the mansion house was his residence. These were included in his bequest for the foundation of the Academy. He was the son of Jeremiah Dummer, and a grandson of Richard Dummer of Bishopstoke, Hants, who was born there in 1599, came to New England in 1632 and was one of the first settlers in Newbury; he returned to England and came again in 1638.

[2] Rev. Samuel Moody,[5] the preceptor of Dummer. Harv. Coll., 1746; died at Exeter, N. H., Dec. 14, 1795, aged 70 years. He was son of Rev. Joseph,[4] of York, Me., Harv. Coll., 1718; a grandson of Rev. Samuel,[3] Harv. Coll., 1697; a gr. grandson of Caleb[2]; a gr. gr. grandson of William[1], who came in 1634 (it was said a saddler) from Ipswich, Co. of Suffolk. He was first of Ipswich, afterwards in 1635 of Newbury, where he continued to reside. He died 25 Oct., 1673.

render this day one to be long remembered by all who were present on this interesting occasion.[3]

*Third meeting* at Magnolia, on Wednesday, August 9, 1882. This place has been, for a long time, a favorite seaside resort. The old road was a pleasant drive, bordered with the wild rose and other flowering plants, with occasional hamlets, whose occupants obtained their livelihood from the land or the briny deep, winding through these fragrant woods and skirting the borders of the green fields that come down even to the beaches that are hard and smooth, and to the rocks whose hoary cliffs extend into the sea, scarred, wrinkled, and worn.

This territory, especially that portion contiguous to the coast, has for the most part, within the past few years, been bought by the wealthy denizens of the city who make this their summer home. The elegant villas, recently built, with their quaint architecture dot the coast, and with their red roofs are in striking contrast with the sombre green of the woods. The name of this locality has also, recently, been changed, and instead of Kettle Cove we have Magnolia, appropriately named from the beautiful flower, whose northern habitat is in close proximity. These woods extending inland from the coast, diversified with ponds and inlets, rocky hills and meadows, the habitat of many rare plants, have been made famous by the herborizations of William Oakes of Ipswich, a very distinguished botanist, who died in 1848, leaving an extensive collection of beautifully prepared specimens of our native flora with many valuable notes and observations. Peter Magnol of Montpellier, France, a very distinguished botanist during the close of the seventeenth and the early part of the eighteenth centuries, in whose honor the name

[3] See Hist. Coll. Essex Inst., vol. XIX.

of Magnolia was given to this genus of beautiful plants, rendered the herborization of Montpellier celebrated. Many botanists flocked thither desirous to enjoy the society and the benefit of his guidance and instruction.

The forenoon was spent in visiting the interesting localities and in the afternoon the meeting was held in a rustic pavilion, tendered to the Institute by the kindness of Mr. Barnard Stanwood.

The President called the meeting to order, and alluded in a few brief remarks to the meeting held in this place some twenty-one years since and noted the great change that has taken place since that time. Vice President F. W. Putnam, being called upon, gave an interesting account of his recent explorations in Tennessee and Ohio. He urged upon his hearers the importance of collecting Indian relics which are very valuable in any museum, for examination and reference. Mr. John H. Sears of Salem, Dr. Morse of Gloucester, President of the Cape Ann Literary and Scientific Association and Prof. William North Rice of Wesleyan University made pertinent remarks. The latter gentleman alluded to the great difference geologically between this rock-bound coast and the valley of the Connecticut, which was his place of residence and the field of his explorations. A vote of thanks was gratefully tendered to Mrs. Maria H. Bray and Mr. Stanwood for courtesies extended during this pleasant visit to Magnolia.

*Fourth meeting*, *Wednesday*, *August* 30, 1882. Meeting at Topsfield. The party from Salem went in barges, those from other towns found their way thither by the cars or private carriages. The usual routine was observed relative to the rambles in the forenoon and the visiting of places of interest; the most notable, perhaps, is the old Capen House, now owned by Charles H. Holmes. It is

built upon the old Garrison house principle, and its architecture is like that of two centuries ago. Mr. Holmes says that it was built in 1651. The afternoon session was held in the Town Hall. The President in the chair. Vice President, Robert S. Rantoul of Salem, was introduced and read an interesting paper entitled "The Essex Junto — The Long Embargo — And The Great Topsfield Caucus of 1808."[4] Mr. Charles J. Peabody and Dea. Augustine Peabody of Topsfield gave interesting facts and traditions of the town. Hon. J. J. H. Gregory of Marblehead spoke of Forestry and the cultivation of trees. Mr. John H. Gould read extracts from the records of the town. He is the present town clerk. Samuel P. Fowler of Danvers, now and ever since its organization a member of the Institute, gave reminiscences of its history, stating many interesting facts in that connection. Hon. N. A. Horton of Salem made a few remarks supplementary to Mr. Rantoul's paper. After the adoption of a vote of thanks to the people of Topsfield for their coöperation and courtesies, adjourned.

Meetings. Regular meetings occur on the first and third Monday evenings of each month. At these or special meetings, the following communications were received or lectures delivered.

On *Monday, Oct. 9, 1882*, Mr. Adoniram C. Orne of Marblehead read a paper "On popular errors in regard to the average duration of life."[5]

*Monday, Nov. 20, 1882.* Mr. John Robinson gave an account of the opening of a shellheap under the direction of the Peabody Academy of Science, on the banks of the Ipswich River; a large and valuable collection of articles

[4] See the Hist. Coll. Essex Inst., Vol. XIX, p. 226.
[5] See Bulletin Essex Inst., Vol. XIV, p. 133.

was found. Many of them were exhibited at the meeting.[6] On the same evening Vice President F. W. Putnam spoke of the results of a search among the heaps on the coast of Maine.[7]

*Monday, Jan. 15, 1883.* Mr. S. S. Blanchard, formerly of Boston, now of Fargo, Dakota, gave a familiar talk on Dakota, alluding to its resources, the fertility of its soil, its large crops raised with little labor, the mineral products, etc. He also spoke of the social advantages, schools, churches, and other public institutions. Wheat farming was particularly noticed and a large picture of the harvesting of wheat on the Ingraham farm was shown; on these large farms machinery is being largely introduced and farming is reduced to a system.

*Monday, Feb. 26, 1883.* E. W. Kinsley, Esq., of Boston, spoke informally on Mexico and its business resources. He alluded to the steamers between New York and Vera Cruz in complimentary terms. The beautiful scenery of the country by rail from Vera Cruz through the mountainous districts was fully described and also the magnificent views as one descends into the city of Mexico; the hotels were comfortable and rapidly adopting modern improvements. A visit to one of the large haciendas with the immense crops stored in large warehouses was fully sketched. A very enthusiastic and hopeful account of the Mexican Central and Atchison and Topeka Railroads was given.

*Monday, March 5, 1883.* Vice President F. W. Putnam spoke on the recent explorations that he had made in the valley of the Little Miami River, in Ohio,

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[6] See Bulletin Essex Inst., Vol. XIV, p. 158.
[7] See Bulletin Essex Inst., Vol. XIV, p. 161.

including an account of the singular altar mounds and the interesting objects found upon the altars. The lecture was illustrated by diagrams, photographs and specimens.

*Monday, April 2, 1883.* Rev. George H. Hosmer read a paper on "the Jesuits."

*Monday, May 14, 1883.* Mr. Robert S. Rantoul read a memoir on our late associate member James O. Safford.[8] Rev. Charles T. Brooks of Newport, R. I., read a memoir on our late associate member, Augustus Story.[9]

The following have been presented and printed in the publications:

"Essex County and the Indians," a lecture before the Beverly Lyceum, Nov. 20, 1832, by Mr. Robert Rantoul, sen.,[10] communicated by Mr. R. S. Rantoul.

"Origin of Salem Plantation." Allotments of Land in Salem to Men, Women, and Maids," by Prof. Herbert B. Adams of Johns Hopkins University.[11]

"The Family of John Perkins of Ipswich," by George A. Perkins, M. D.[12]

"Common Fields in Salem," by Prof. Herbert Adams.[13]

"The family of William Townsend of Boston," by Henry F. Waters.[14]

"The Early Settlers of Rowley, Mass., including all who were here before 1662, with a few generations of their descendants," by George B. Blodgette, A. M., of Rowley.[15]

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[8] Hist. Coll. Essex Inst., Vol. XX, p. 81. [9] Hist. Coll. Essex Inst., Vol. XX, p. 115. [10] Hist. Coll. Essex Inst., Vol. XIX, p. 126. [11] Hist. Coll. Essex Inst., Vol. XIX, p. 153. [12] Hist. Coll. Essex Inst., Vol. XIX, p. 213. [13] Hist. Coll. Essex Inst., Vol. XIX, p. 241. [14] Hist. Coll. Essex Inst., Vol. XIX, p. 269. [15] Hist. Coll. Essex Inst., Vol. XIX, p. 297.

"A Note on the authenticity of the Portraits of Gov. Endecott," by Mr. R. S. Rantoul.[16]

"Sketch of the Family of Thomas Townsend of Lynn, Joseph Townsend of Boston, and a few English Notes relating to the name of Townsend, by Henry F. Waters.[17]

"Salem Meadows, Woodland, and Town Neck," by Prof. Herbert B. Adams.[18]

"Notice of Charles Davis of Beverly, Librarian of Essex Institute," by Mr. Robert S. Rantoul.[19]

"Carcinological Notes, No. V," by Mr. J. S. Kingsley.[20]

"Catalogue of the Flora of Oak Island, Revere, Mass., with notes," by Herbert Young; "Introduction and Summary" by Mr. John Robinson.[21]

"Arrow makers at Pine Grove, by Mr. John Robinson.[22]

A Social Meeting of the members and their families was held in the rooms on the evening of Jan. 1, 1883. Mr. Alban Andrén of Beverly gave a familiar talk on Sweden, illustrating his remarks by lantern views. Simple refreshments were served.

Receptions. Wednesday, May 31, 1882. During the evening a reception was tendered to Mr. Raymond Lee Newcomb, on his return to Salem from his perilous voyage to the Arctic regions in the steamer "Jeannette." The large hall on the second floor was thrown open and after a few words of welcome from the President, and an address from Vice President D. B. Hagar, Mr. Newcomb gave a brief account of his trip and related some of the experiences of the expedition. At the close of his remarks Mr. Newcomb was introduced to the members and their families.

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[16] Hist. Coll. Essex Inst., Vol. XX, p. 1. [17] Hist. Coll. Essex Inst., Vol. XX, p. 37. [18] Hist. Coll. Essex Inst., Vol. XX, p. 52. [19] Hist. Coll. Essex Inst., Vol. XX, p. 73. [20] Bulletin Essex Inst., Vol. XIV, p. 105. [21] Bulletin of Essex Inst., Vol. XIV, p. 141. [22] Bulletin Essex Inst., Vol. XIV, p. 163.

On Friday, Sept. 8, 1882, at noon, President Chester A. Arthur visited the rooms. There was no ceremony or formality. A few members happened to be present and escorted him through the building and about the grounds. He was accompanied by his private secretary Phillips, Surrogate Rollins of New York, and Capt. Green of the "Despatch."

Friday, Nov. 10, 1882. Dr. William B. Carpenter, of England, was in Salem, the guest of Robert S. Rantoul, Esq. The forenoon was spent in visiting the State Normal School, the Court Houses, East India Marine Hall, and other objects of interest. In the afternoon he was in the rooms of the Institute where he received calls from ladies and gentlemen of our city.

By the joint invitation of the Institute and the Peabody Academy of Science, the Boxford Natural History Society on Wednesday, May 31, 1882, The President and faculty of Wellesley College, on Monday, June 12, 1882, and the West Newbury Natural History Club, on Oct. 28, 1882, visited Salem on the respective days named, to examine the collections in the East India Marine Hall, the libraries and collections in Plummer Hall and other objects of interest.

Lectures. A course of eight Lectures, under the direction of the lecture committee, has been delivered, as follows: *First*, Alban Andrén of Beverly, "Sweden," Wed., Nov. 22, 1882. *Second*, Frederick A. Ober, of Beverly, "Mexico," Wed., Nov. 29, 1882. *Third*, G. M. Towle, "Eugenie, ex-Empress of France," Wed., Dec. 6, 1882. *Fourth*, G. M. Towle, "John Bright," Wed., Dec. 13, 1882. *Fifth*, G. M. Towle, Wed., Dec. 20, 1882, "The Irish Struggle." *Sixth*, G. M. Towle, "Victor Hugo," Wed., Dec. 27, 1882. *Seventh*, I. J. Osbun,

"Steam," Wed., Jan. 3, 1883. *Eighth*, I. J. Osbun, "The Storage of Electricity," Wed., Feb. 21, 1883.

In addition to the above, by an arrangement made with the Trustees of the Peabody Academy of Science, two courses of free lectures were given. *First course*, by Prof. C. C. Bessey, of the State Agricultural College, Iowa, on Thursday afternoons, Jan. 18, 25, and Feb. 1, 1883, three lectures on "Problems in Vegetable Physiology:" I. "Green slime and yeast Plants." II. "Structural and physiological development of the vegetable kingdom." III. "The evolution of the Flower." *Second course:* five lectures by Prof. J. Walter Fewkes, an assistant in the Museum of Comparative Zoölogy, Cambridge. "Corals and Coral Islands," on the afternoons of Wednesdays, Jan. 17, 24, 31, Feb. 7, 14, 1883.

Concerts. Under the personal direction of the curator of music, two chamber concerts have been given with great acceptance. This was the fourteenth concert season of the Institute. *First*, Friday evening, Feb. 16, 1883. The selections of the two trios by Beethoven and Schubert formed a happy contrast, the latter perhaps being the more brilliant. It was very pleasant to hear Mr. Arthur W. Foote again in Salem after so long an interval. He was ably assisted by Messrs. Gustave Dannreuther, Wulf Fries, and Miss Louise Gage. *Second*, Monday, March 26, 1883. Mr. Hiram G. Tucker, of Boston, gave a piano recital. He had the assistance of Miss Grace F. Dalton, soprano vocalist. Both parties did themselves much credit in their respective numbers and the concert was both enjoyable and interesting.

Excursions. *Friday*, June 9, 1882, visited Plymouth,

tarried at the Samoset House and returned on Saturday in the afternoon. The attractive objects: "The national monument to the forefathers," which stands eighty-one feet from the ground, not finished; Pilgrim Hall, built in 1824, rebuilt in 1880 by the liberality of Joseph Henry Stickney, Esq., of Baltimore, Md., containing many relics brought over by the Pilgrims, and several large and striking paintings, representing the landing and ideas connected therewith; Plymouth Rock returned to the original spot and now covered by a solid granite canopy of elaborate architectural design; Burial Hill and other places of interest, were visited by some of the party.

*Thursday*, Aug. 3, 1882. A trip along the North Shore to Pigeon Cove in the steamer General Bartlett, Capt. J. O. Davis, commander. The party landed at the Cove and spent about an hour ashore, then across the bay to Swampscott and along the Marblehead shore to the place of departure.

*Wednesday*, Sept. 6, 1882. A party left for an excursion to the summit of Mount Moosilauke. A special car direct from Salem to Plymouth, N. H., without change, thence to the village of Warren, where the mountain ascent is made on buckboards or in wagons, to the breezy Point House, a bright roomy hotel with broad piazzas and a wide view of the unbroken forest, then to the Tip Top House. This hotel, as well as the Breezy Point House, will be found in all respects comfortable, while the mountain scenery is unsurpassed. Returned on Saturday the ninth.

Publications have been issued as heretofore: the Bulletin, Vol. xiv, and the Historical Collections, Vol. xix. The exchange list, with few exceptions, continues the same as last year.

LIBRARY.— The additions to the Library for the year (May, 1882 to May, 1883) have been as follows:

*By Donation.*

| | |
|---|---|
| Folios, | 24 |
| Quartos, | 160 |
| Octavos, | 891 |
| Duodecimos, | 296 |
| Sexdecimos, | 54 |
| Total of bound volumes, | 1,425 |
| Pamphlets and serials, | 10,143 |
| Total of donations, | 11,568 |

*By Exchange.*

| | |
|---|---|
| Folios, | 1 |
| Quartos, | 18 |
| Octavos, | 95 |
| Duodecimos, | 4 |
| Total of bound volumes, | 118 |
| Pamphlets and serials, | 2,172 |
| Total of exchanges, | 2,290 |

*By Purchase.*

| | |
|---|---|
| Quartos, | 5 |
| Octavos, | 107 |
| Duodecimos, | 179 |
| Sexdecimos, | 15 |
| Total of bound volumes, | 306 |
| Pamphlets and serials, | 197 |
| Total of purchases, | 503 |
| Total of donations, | 11,568 |
| Total of exchanges, | 2,290 |
| Total of purchases, | 503 |
| Total of additions, | 14,361 |

Of the total number of pamphlets and serials, 6,447 were pamphlets, and 6,065 were serials.

The donations to the Library for the year have been received from one hundred and fifty-six individuals and

forty-one departments of the General and State governments and societies, five of which are foreign. The exchanges from one hundred and fifty-six societies and incorporate institutions, of which eighty-four are foreign; also from editors and publishers.

The annual examination of the Library has been made. Of the eight volumes that were missing last year, five have been returned; thirteen others are now missing from their places.

Donations or exchanges have been received from the following:

| | Vols. | Pam. |
|---|---|---|
| Albany, N. Y., State Library, | 7 | 1 |
| Almy, James F., | | 1 |
| Alnwick, Eng., Berwickshire Naturalists' Club, | | 1 |
| American Association for the Advancement of Science, | 1 | |
| Amherst College Library, | | 1 |
| Amiens, Société Linnéenne du Nord de la France, | | 11 |
| Anagnos, M., South Boston, | | 1 |
| Andrews, Hiram, | 5 | 2 |
| Andrews, William P., | | 53 |
| Appleton, F. H., Peabody, | | 1 |
| Appleton, William S., Boston, | | 1 |
| Archæological Institute of America, | 1 | 3 |
| Atkinson, Edward, Boston, | | 1 |
| Baltimore, Md., Johns Hopkins University, | 9 | |
| Baltimore, Md., Johns Hopkins University Library of Historical and Political Science, | | 7 |
| Baltimore, Md., Peabody Institute, | | 1 |
| Bamberg, Naturforschende Gesellschaft, | | 1 |
| Bancroft, Rev. C. F. P., Andover, | | 1 |
| Barton, William G., | | 77 |
| Belfast, Eng., Naturalists' Field Club, | | 2 |
| Bemis, Miss Caroline, | | 3 |
| Berlin, Gesellschaft Naturforschender Freunde, | | 1 |
| Berlin, Verein zur Beförderung des Gartenbaues, | | 24 |
| Berlin, Zeitschrift für die gesammten Naturwissenschaften, | 1 | |
| Bern, Naturforschende Gesellschaft, | | 2 |
| Bolles, Rev. E. C., D. D., | 21 | 151 |
| Bologna, Accademia delle Scienze, | | 1 |

| | Vols. | Pam. |
|---|---|---|
| Bonn, Naturhistorischer Verein, | 1 | 2 |
| Boston, American Academy of Arts and Sciences, | 1 | 1 |
| Boston, Appalachian Mountain Club, | | 2 |
| Boston, Board of Health, | | 16 |
| Boston, Bostonian Society, | | 1 |
| Boston, City of, | 6 | |
| Boston, City Hospital, | 1 | |
| Boston, City Hospital Medical Library, | 1 | |
| Boston, Massachusetts General Hospital Trustees, | | 1 |
| Boston, Massachusetts Historical Society, | 2 | |
| Boston, Massachusetts Horticultural Society, | | 2 |
| Boston, Massachusetts Institute of Technology, | | 3 |
| Boston, Massachusetts Medical Society, | | 1 |
| Boston, Massachusetts State Library, | | 1 |
| Boston, M. O. L. L. U. S. Council of Commandery of Massachusetts, | 1 | |
| Boston, National Association of Wool Manufacturers, | | 5 |
| Boston, New England Historic Genealogical Society, | 2 | 7 |
| Boston, New England Manufacturers' and Mechanics' Institute, | 2 | |
| Boston, Public Library, | | 5 |
| Boston, Scientific Society, | | 3 |
| Boston, Society of Natural History, | | 17 |
| Boston, Zoölogical Society, | | 2 |
| Boutwell, F. M., Groton, | | 1 |
| Bovey, Henry T., Montreal, | 1 | 2 |
| Braunschweig, F. Vieweg und Sohn, | | 3 |
| Bremen, Naturwissenschaftlicher Verein, | | 1 |
| Briggs, Mrs. Edward T., Newspapers, | | 28 |
| Brigham, L. F., | 1 | |
| Brinley, Francis, Newport, R. I., | | 1 |
| Bristol, Eng., Naturalists' Society, | | 3 |
| Brooklyn, N. Y., Long Island Historical Society, | | 1 |
| Brooks, Mrs. Henry M. Newspapers, | | 2 |
| Brown, Augustus S., | 1 | |
| Brown, F. H., Boston, | 1 | |
| Brown, Henry A., | 1 | |
| Brown, Samuel J., Salisbury, | | 1 |
| Browne, Albert G., | 3 | |
| Brünn, Naturforschender Verein, | 1 | |
| Brunswick, Me., Bowdoin College, | | 2 |
| Bruxelles, Société Belge de Microscopie, | 1 | 12 |
| Bruxelles, Société Entomologique de Belgique, | 1 | 1 |

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| Bruxelles, Société Malacologique de Belgique, | 2 | 16 |
| Buenos Aires, Sociedad Cientifica Argentina, | | 6 |
| Buffalo, N. Y., Society of Natural Sciences, | | 1 |
| Buffalo, N. Y., Young Men's Association, | | 1 |
| Burchard, Horatio C., Washington, D. C., | | 3 |
| Burns, Charles E., | | 10 |
| Bützow, Verein der Freunde der Naturgeschichte, | | 1 |
| Caen, Académie Nationale des Sciences, | 2 | |
| Calcutta, Geological Survey of India, | | 7 |
| Caldwell, Augustine, Ipswich, | | 2 |
| Caldwell, Rev. S. L., Poughkeepsie, N. Y., | | 1 |
| Caller, James M., | 1 | |
| Cambridge, Harvard University, | 1 | 3 |
| Cambridge, Museum of Comparative Zoölogy, | | 5 |
| Cambridge, Nuttall Ornithological Club, | | 4 |
| Cambridge, Peabody Museum of American Archæology and Ethnology, | | 1 |
| Carpenter, Rev. C. C., Mt. Vernon, N. H., | | 2 |
| Case, Theodore S., Kansas City, Mo., | | 1 |
| Cherbourg, Société Nationale des Sciences Naturelles, | 1 | 1 |
| Chicago, Ill., Headquarters Military Division of the Missouri, | | 1 |
| Chicago, Ill., Historical Society, | 1 | 1 |
| Chicago, Ill., Public Library, | | 1 |
| Christiania, La Commission géodésique internationale, | | 4 |
| Christiania, K. N. Frederics Universitets, | 1 | 6 |
| Christiania, Videnskabs Selskabet, | 3 | |
| Cincinnati, O., Mechanics' Institute, | | 4 |
| Cincinnati, O., Society of Natural History, | | 4 |
| Cleveland, H. W. S., Springfield, Ill., | | 2 |
| Cleveland, O., Western Reserve and Northern Ohio Historical Society, | | 1 |
| Cole, Miss Caroline J., | | 3 |
| Cole, Mrs. N. D., Newspapers, | | 84 |
| Columbia, Mo., State University, | | 1 |
| Currier, John M., Castleton, Vt., | | 2 |
| Curwen, George R., | | 1 |
| Curwen, James B., | 34 | 41 |
| Cushing, L. B., Newburyport, | 10 | |
| Cutter, A. E., Charlestown, | | 1 |
| Danzig, Naturforschende Gesellschaft, | 1 | |
| Darmstadt, Verein für Erdkunde, | 1 | |
| Davenport, Ia., Academy of Natural Science, | | 2 |

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| Dennis, W. D., | | 3 |
| Dodge, James H., Boston, | 1 | |
| Donnell, E. J., New York, N. Y., | | 2 |
| Dresden, Naturwissenschaftliche Gesellschaft Isis, | | 3 |
| Dublin, Royal Irish Academy, | | 8 |
| Dudley, A. M., | 9 | |
| Eads, H. L., So. Union, Ky., | 1 | |
| Edinburgh, Royal Society, | 1 | |
| Edmands, T. F., Boston, | 1 | |
| Ellis, Henry P., Milwaukee, | | 1 |
| Emden, Naturforschende Gesellschaft, | | 1 |
| Emmerton, James A., | 6 | 54 |
| Epping Forest and County of Essex Naturalists' Field Club, | | 1 |
| Erfurt, K. Akademie gemeinnütziger Wissenschaften, | | 1 |
| Erlangen, Physikalisch-medicinische Societät, | | 1 |
| Falmouth, Eng., Royal Cornwall Polytechnic Society, | | 1 |
| Firenze, Istituto di Studi Superiori, | | 12 |
| Folsam, A. A., Boston, | | 3 |
| Foote & Horton, Newspapers, | 4 | 314 |
| Fox, G. V., Washington, D. C., | | 2 |
| Frankfurt, a. M., Senckenbergische naturforschende Gesellschaft, | 1 | 1 |
| Frankfurt, a. M., Zoologische Gesellschaft, | | 6 |
| Freiburg, Naturforschende Gesellschaft, | | 1 |
| Gatschet, Albert S., Washington, D. C., | | 2 |
| Genève, L'Institut National Genèvois, | 1 | |
| Genève, Société de Physique et d'Histoire Naturelle, | 1 | |
| George, M. C., Washington, D. C., | | 1 |
| Gillis, James A., | 17 | 148 |
| Glasgow, Natural History Society, | | 1 |
| Göttingen, K. Gesellschaft der Wissenschaften, | 2 | |
| Gould, John H., Topsfield, | | 1 |
| Green, Samuel A., Boston, | 82 | 322 |
| Hager, Albert D., Chicago, Ill., | | 1 |
| Halifax, N. S., Institute of Natural Science, | | 1 |
| Halle, K. Leop.-Carolinische D. Akademie der Naturforscher, | | 4 |
| Hamburg, Verein für Naturwissenschaftliche Unterhaltung, | 1 | 2 |
| Hamilton, R. I., Narragansett Historical Publishing Company, | | 4 |
| Hammond, Joseph, | | 1 |

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|---|---|---|
| Harlem, Société Hollandaise des Sciences, | | 3 |
| Hart, Charles H., Philadelphia, Pa., | | 1 |
| Hart, Rev. Samuel, Hartford, Ct., | | 1 |
| Haskell, Mrs. A. M., West Roxbury, | 1 | |
| Hassam, John T., Boston, | | 1 |
| Hazen, W. B., Washington, D. C., | | 1 |
| Hildeburn, Charles R., Philadelphia, Pa., | | 1 |
| Hill, B. D., Peabody, Newspapers, | | 4 |
| Hill, H. A., Boston, | 1 | |
| Hingham, First Parish, | 1 | |
| Hoar, E. R., Concord, | | 1 |
| Hobart Town, Government of Tasmania, | 1 | 3 |
| Hobart Town, Royal Society of Tasmania, | | 1 |
| Holmes, John C., Detroit, Mich., | | 1 |
| Horton, N. A., | 1 | |
| Huguet-Latour, L. A., Montreal, | 3 | 24 |
| Hunnewell, James F., Charlestown, | 1 | |
| Hunt, Miss S. E., | | 12 |
| Hunt, T. F., | 166 | 188 |
| Hunt, Mrs. Thomas, | 46 | |
| Illinois Department of Agriculture, | | 5 |
| Israel, Rev. F., Newspapers, | 2 | 40 |
| James, U. P., Cincinnati, Ohio., | | 2 |
| Jenison, O. A., Lansing, Mich., | 1 | |
| Johnson, D. H., | 8 | 24 |
| Johnson, Samuel, Estate of the late, Newspapers, | 79 | 1744 |
| Kimball, Mrs. James, | 4 | 4 |
| Kimball, Jonathan, Chelsea, | | 1 |
| Kjöbenhavn, K. D. Videnskabernes Selskab, | | 3 |
| Königsberg, Physikalisch-ökonomische Gesellschaft, | | 3 |
| Lansing, Mich., State Library, | 25 | 7 |
| Latham, Williams, Bridgewater, | 1 | |
| Lausanne, Société Vaudoise des Sciences Naturelles, | 3 | 2 |
| Lawrence, George N., New York, N. Y., | | 6 |
| Leach, Henry C., | 1 | |
| Lee, F. H., Newspapers, | 1 | 343 |
| Leeds, Philosophical and Literary Society, | | 1 |
| LeMans, Société d'Agriculture, Sciences, et Arts de la Sarthe, | | 2 |
| Lincoln, Francis H., Boston, | | 1 |
| London, Royal Society, | | 7 |
| Lord, G. R., | 31 | 28 |
| Lothrop, D. & Co., Boston, | 2 | |

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| Lowell, Old Residents' Historical Association, | | 1 |
| Lund, Carolinische Universität, | 4 | 6 |
| Lüneburg, Naturwissenschaftlicher Verein, | | 1 |
| Lyon, Académie des Sciences, Belles-Lettres et Arts, | 1 | |
| Lyon, Société d'Agriculture, | 2 | |
| Lyon, Société Linnéenne, | 1 | |
| Mack, David, Hampton, Va., | 8 | 31 |
| Mack, Miss Esther C., | 1 | 12 |
| Madison, Wis., State Library, | | 1 |
| Madrid, Sociedad Española de Historia Natural, | | 1 |
| Malden, Middlesex Institute, | | 1 |
| Manchester, Rev. L. C., Lowell, | | 18 |
| Manning, Robert, | | 50 |
| Manson, A. S., Boston, | 1 | 9 |
| Marburg, Gesellschaft zur Beförderung der gesammten Naturwissenschaften, | | 4 |
| Marsh, Rev. W. H. H., New Brunswick, N. J., | 1 | |
| Marshall, John W., Rockport, | | 1 |
| Massachusetts, Commonwealth of, | 2 | |
| McDanolds, James S., Trenton, N. J., | 2 | |
| Meek & Fielden, | 1 | |
| Meek, Henry M., | 1 | |
| Merrill, N. F., | | 1 |
| Merrill, William, Jr., West Newbury, | | 29 |
| Mexico, Museo Nacional, | | 3 |
| Middletown, Conn., Museum of Wesleyan University, | | 1 |
| Milburn, Mrs. W., | 2 | |
| Montreal, Natural History Society, | | 1 |
| Montreal, Société Historique, | | 1 |
| Moulton, J. T., Lynn, | 3 | |
| München, K. B. Akademie der Wissenschaften, | | 14 |
| Münster, Westfälischer Verein für Wissenschaften u. Kunst, | | 1 |
| Nagle, J. T., New York, N. Y., | | 2 |
| Nevins, W. S., Newspapers, | | 4 |
| Newark, N. J., Historical Society, | 3 | 2 |
| New Haven, Conn., Academy of Arts and Sciences, | | 2 |
| New Haven, Conn., Yale College Library, | | 4 |
| New York, Academy of Sciences, | | 8 |
| New York, American Geographical Society, | | 7 |
| New York, American Museum of Natural History, | | 5 |
| New York, Chamber of Commerce, | 1 | |
| New York, Genealogical and Biographical Society, | | 3 |

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| New York, Historical Society, | 1 | |
| New York, Linnæan Society, | 1 | |
| New York, Mercantile Library Association, | | 2 |
| Northampton, Secretary of Smith College, | | 11 |
| Northend, W. D., | 106 | 143 |
| Northey, William, | 6 | 146 |
| Norwegian No. Atlantic Expedition, Editorial Committee, | | 6 |
| Odell, Charles, | 10 | 12 |
| Oliver, Henry K., | 1 | |
| Osgood, John C., | 17 | 12 |
| Palfray, C. W., | 33 | 274 |
| Palmer, B. P., Boston, | 1 | |
| Paris, Société d'Acclimatation, | | 11 |
| Paris, Société d'Anthropologie, | | 5 |
| Paris, Société des Etudes Historiques, | | 8 |
| Peabody, G. L., Newspapers, | 2 | 2 |
| Peabody, John P., | 1 | |
| Peabody Institute, Peabody, | 1 | 188 |
| Peet, Rev. S. D., Clinton, Wis., | | 4 |
| Perkins, A. C., Exeter, N. H., | | 4 |
| Perkins, George A., | | 23 |
| Perley, Jonathan, | 2 | |
| Perley, Sidney, | | 2 |
| Perry, Rev. W. Stevens, Davenport, Ia., | | 1 |
| Philadelphia, Pa., American-Belgian Chamber of Commerce, | | 1 |
| Philadelphia, Pa., Historical Society of Pennsylvania, | | 4 |
| Philadelphia, Pa., Library Company, | | 2 |
| Philadelphia, Pa., Mercantile Library, | | 4 |
| Philadelphia, Pa., Numismatic and Antiquarian Society, | | 3 |
| Philadelphia, Pa., Woman's Medical College, | | 1 |
| Philadelphia, Pa., Zoölogical Society, | | 2 |
| Pickering, Miss Mary O., Newspapers, | | 162 |
| Pingree, David, | 6 | 101 |
| Plumer, Miss Mary N., Newspapers, | | 3 |
| Pool, Wellington, Wenham, | | 2 |
| Poole, W. F., Chicago, Ill., | | 1 |
| Preston, Charles P., Danvers, | | 1 |
| Providence, R. I., Public Library, | 1 | 18 |
| Providence, R. I., Rhode Island Historical Society, | | 1 |
| Putnam, Mrs. Eben, | | 48 |
| Putnam, F. W., Cambridge, | 1 | 4 |
| Quebec, Literary and Historical Society, | | 2 |

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| Ramsay, Alexander, London, Eng., | | 4 |
| Rantoul, R. S., Newspapers, | 60 | 2383 |
| Regensburg, K. b. botanische Gesellschaft, | 2 | |
| Regensburg, Zoologisch-mineralogischer Verein, | | 1 |
| Rice, William, Springfield, | | 1 |
| Riga, Naturforschender Verein, | | 1 |
| Roads, Samuel, Jr., Marblehead, | 2 | |
| Robinson, E. P., Saugus, Newspapers, | | |
| Robinson, John, | 9 | 67 |
| Ropes, Rev. W. L., Andover, | | 1 |
| Sale, John, Chelsea, | 7 | |
| Salem, Peabody Academy of Science, | 163 | 1503 |
| San Francisco, Cal., Academy of Science, | | 1 |
| San Francisco, Cal., Mercantile Library Association, | | 1 |
| Savannah, Ga., Georgia Historical Society, | | 1 |
| Scudder, Samuel H., Cambridge, | | 1 |
| S'Gravenhage, Nederlandsch-entomologische Vereenig-ing, | | 4 |
| Smith, George Plumer, Philadelphia, Pa., | 2 | 3 |
| South Hadley, Mt. Holyoke Female Seminary, | | 1 |
| Soule, Charles C., Boston, | 2 | 23 |
| Springfield, Mo., Drury College, | | 3 |
| Stanwood, James R., Boston, | 1 | |
| Stettin, Entomologischer Verein, | 1 | |
| St. Gallen, St. Gallische naturwissenschaftliche Gesell-schaft, | 1 | |
| St. John, N. B., Natural History Society, | | 1 |
| St. Louis, Mo., Missouri Historical Society, | | 4 |
| St. Louis, Mo., Public School Library, | | 2 |
| Stockholm, Entomologiska Föreningen, | | 5 |
| Stockholm, R. Académie des Sciences, | 13 | 1 |
| Stone, Eben F., Washington, D. C., | 18 | 170 |
| Stone, Robert, Newspapers, | | |
| Stone, William, Newspapers, | 72 | 405 |
| Stowers, Mrs. Nathaniel, | 10 | 2 |
| St. Pétersbourg, Académie Impériale des Sciences, | 1 | 3 |
| Strahan, Thomas, Chelsea, | | 1 |
| Sydney, N. S. W., Department of Mines, | 1 | |
| Sydney, N. S. W., Royal Society of New South Wales, | 3 | 2 |
| Taunton, Eng., Somersetshire Archæological and Natu-ral History Society, | 1 | |
| Taunton, Public Library, | | 1 |

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|---|---|---|
| Teele, Rev. A. K., Milton, | | 1 |
| Tenney, Jonathan, Albany, N. Y., | | 1 |
| Throndhjem, K. Norske Videnskabers Selskab, | | 1 |
| Titus, Rev. Anson, Jr., So. Weymouth, | | 2 |
| Tokio, Japan, University of, | 2 | 1 |
| Topeka, Kans., State Historical Society, | | 1 |
| Toronto, Canadian Institute, | | 1 |
| Tuckerman, J. F., | 1 | |
| Unknown, | 2 | 11 |
| Upsal, Societas R. Scientiarum, | 1 | |
| U. S. Bureau of Education, | | 14 |
| U. S. Bureau of Ethnology, | 1 | |
| U. S. Chief of Engineers, | 10 | |
| U. S. Chief Signal Officer, | 3 | 5 |
| U. S. Coast and Geodetic Survey, | 1 | |
| U. S. Commission of Fish and Fisheries, | 1 | 17 |
| U. S. Department of the Interior, | 63 | 3 |
| U. S. Department of State, | 138 | |
| U. S. Hydrographic Office, Charts, | | |
| U. S. National Board of Health, | | 10 |
| U. S. National Museum, | | 27 |
| U. S. Nautical Almanac Office, | 1 | |
| U. S. Naval Observatory, | 1 | 1 |
| U. S. Patent Office, | 3 | 51 |
| Walter, Joseph R., Wilmington, Del., Newspapers, | | |
| Waring, George E., Jr., Newport, R. I., | | 2 |
| Washington, D. C., Smithsonian Institution, | 2 | 8 |
| Waters, C. C., Jamestown, D. T., Map, | | |
| Waters, H. F., | 27 | 298 |
| Waters, J. Linton, | 44 | 145 |
| Waters, Stanley, Newspapers, | 1 | 28 |
| Waterville, Me., Colby University, | | 2 |
| Watson, Miss C. A., Map, | | 1 |
| Webb, Miss Sarah F., | 10 | |
| Whipple, George M., | 1 | 4 |
| Whipple, Mrs. George M., | 3 | |
| Whitcher, Mary, Shaker Village, N. H., | | 13 |
| Whitney, Mrs. Mary W., Lawrence, | | 31 |
| Whittier, Charles C., Boston, Genealogical Chart, | | |
| Wien, K. k. Zoologisch-botanische Gesellschaft, | 1 | |
| Wien, Verein zur Verbreitung naturwissenschaftliche Kenntnisse, | 1 | |

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| Wiesbaden, Nassauischer Verein für Naturkunde, | 2 | |
| Wilkes-Barre, Pa., Wyoming Historical and Geological Society, | | 2 |
| Willson, Rev. E. B., | | 116 |
| Wilmington, Delaware Historical Society, | | 1 |
| Wilson, John & Son, Cambridge, | 1 | |
| Winnipeg, Historical and Scientific Society of Manitoba, | | 5 |
| Winsor, Justin, Cambridge, | | 34 |
| Worcester, American Antiquarian Society, | | 3 |
| Worcester, Society of Antiquity, | | 1 |
| Würzburg, Physikalisch-medicinische Gesellschaft, | 1 | 1 |

The following have been received from editors or publishers: —

American Journal of Science.
Canadian Naturalist.
Cape Ann Bulletin.
Danvers Mirror.
Essex County Statesman.
European Mail.
Fireside Favorite.
Gardener's Monthly and Horticulturist.
Ipswich Chronicle.
La Bibliophilie.
Lawrence American.
Lynn Bee.
Magnolia Leaves.
Marblehead Messenger.
Medical Register.
Musical Herald.
Nation.
Naturalist's Leisure Hour and Monthly Bulletin.
Nature.
Newton Transcript.
Our Dumb Animals.
Peabody Press.
Quaritch's Catalogue.
Sailors' Magazine and Seamen's Friend.
Salem Gazette.
Salem Observer.
Salem Post.
Salem Register.
Turner's Public Spirit.
West Newbury Era.
Zoologischer Anzeiger.

An Art Exhibition opened on Tuesday evening, May 30, 1882. In some respects it was far superior to its predecessors, although those given in former years have proved very successful. The influence of such exhibitions can be noticed in the steady increase from year to year in the number of exhibitors and the progress developed in the interest of the general public relative to art matters. There were on exhibition from about one hundred and

twenty-five contributors, nearly four hundred specimens in the various departments of art, including pictures from the amateur's pencil up to the elaborate oil painting, decorated ware, plaques, panels, etc., in extensive and beautiful array. The arrangement was very effective, and the hall very attractive.

The following is a list of the contributors.

Geo. W. Harvey.
Frank W. Benson.
Miss Edith Rantoul.
Anson Daniels.
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Miss B. A. Putnam.
" A. B. Kilham.
" M. W. Haskell.
O. W. H. Upham.
Anna R. Thacher.
Miss M. M. Brooks.
" I. S. Jackson.
" J. S. Warden.
" A. M. Quimby.
" A. G. Pingree.
" Minnie Pond.
" K. Pond.
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H. B. H. Harrington.
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" L. J. Grant.
" Bessie F. Lord.
J. J. Redmond.
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Miss L. M. Symonds.
" H. W. Brown.
" Mary K. Robinson.
Mrs. J. Robinson.
Pupils of Miss A. G. Pingree.
Miss Edith Harlow.
Master Arthur F. Harlow.
Mrs. J. H. Roberts.
Miss A. B. Holden.
" Edith B. Dalton.
" B. P. Smith.
" E. R. Pickering.
" Sarah B. Balch.

Miss E. W. Fiske.
Charles Norris.
Miss A. P. Putnam.
" F. Emerson.
" M. Swan.
Mrs. J. Battis 2d.
Miss Mary C. Torrey.
" C. L. Adams.
Mrs. George S. Osborne.
Miss E. R. Edmands.
" M. E. Phippen.
Mrs. D. Kelham, jr.
Miss Lucy B. Hood.
" C. B. Harrington.
" N. G. Peirce.
" L. C. G. Peirce.
" C. F. Chase.
" Rose Farndale.
" Eva "
Mrs. G. P. Osgood.
" H. P. Ives.
Master I. P. Symonds.
" J. G. Morse.
Miss C. L. Grant.
Mr. E. C. Larrabee.
Miss Ida Tappan.
" Julia Barker.
" Lizzie B. Gifford.
" Lizzie L. Read.
" Maggie Bolles.
Geo. A. May.
Arthur W. Dow.
Miss A. P. Pitman.
Miss Mary L. King.
" H. F. Buxton.
Mrs. N. G. Symonds.
" Martha G. Smith.
Miss Edith O. Morse.
" A. S. Tukey.
" Clara L. Pitman.
" L. L. Symonds.
Mrs. Joseph Symonds.
Albert I. Whipple.
Mrs. C. F. Quincy.
Miss L. L. A. Very.

Mr. John M. Murray, from the Lawrence pottery works in Beverly was present with his potter's wheel and gave practical illustrations of the manner that shapeless and unpromising clay can be transformed into vessels of usefulness and ornament.

Frequent and valuable additions to the art library are made by the curator of painting and sculpture, and the number of persons interested in this subject who consult this library is increasing. Many of the volumes contain valuable and useful information which the student could not obtain readily elsewhere.

Horticultural Exhibition. The annual Horticultural Exhibition was held on Wednesday and Thursday, Sept.

20 and 21, 1882, although the season was very unpropitious for a large and fine display, on account of the excessive drought, yet there was a creditable showing, and the hall had a most attractive appearance by the judicious arrangement of the various contributions.

Good specimens of vegetables were received from Plummer Farm School, Salem, Andrew Nichols of Danvers, J. Page Weston of Danvers; W. A. Ireland, E. Goss and Clarence Murphy of Salem. Contributors of fruit were as follows: Charles A. Ropes, George F. Brown, George Bowker, A. C. Locke, N. C. Locke, Charles Higbee, S. Endicott Peabody, J. C. Rogers, E. Verry, Caleb Buffum, Miss S. O. Russell, Miss E. P. Richardson, James P. Cook, Fred. Lamson, George D. Glover, G. H. Frye, jr., Mrs. Woodbury, Mrs. E. H. Valentine, E. Goss and others.

The centre of the hall was occupied by a large stand of foliage plants. Among them were some beautiful specimens of ferns in fine condition from the collection of S. Endicott Peabody at Kernwood; also fine foliage and flowering plants in pots from H. W. Putnam, William A. Ireland, H. C. Merriam and Mrs. C. Buffum.

Mrs. L. P. Weston of Danvers, W. A. Ireland, George D. Phippen, J. C. Rogers, H. C. Merriam, Miss Mary Ropes, Chas. A. Putnam, Mrs. W. F. Gardner and others, had very creditable exhibits of cut flowers. John H. Sears presented a collection of native plants.

The judges, Messrs. J. E. Peabody, R. C. Manning and Hugh Wilson, awarded the prizes as follows:—Best green-house plants, S. Endicott Peabody; coleus, Henry W. Putnam; cut flowers, Mrs. L. P. Weston of Danvers. Pears, best Beurre Bosc, George F. Brown; best Beurre d' Anjou, N. C. Locke; best Beurre Diel, C. A. Ropes; best Beurre Superfin, C. A. Ropes; best Belle Lucrative,

G. H. Frye, jr.; best Duchess d'Angoulème, N. C. Locke; best Louise Bonne de Jersey, S. E. Peabody; best Lawrence, A. C. Locke; best Seckel, F. Lamson; best Flemish Beauty, Mrs. Woodbury.

Apples, best Gravenstein, Mrs. E. H. Valentine; best Baldwin, C. A. Ropes; best Porter, Caleb Buffum.

Grapes, Best Native, George D. Glover and Mrs. J. Wilson; best Foreign, S. E. Peabody and J. C. Rogers; best Delaware, Charles Higbee.

Best collection of vegetables, Plummer Farm School.

Gratuities were awarded to H. C. Merriam and J. C. Rogers for flowers; Andrew Nichols for vegetables; William A. Ireland for tomatoes.

Museum. The specimens in natural history, including those in archæology, which have been given during the year are on deposit with the Trustees of the Peabody Academy of Science, in accordance with previous arrangements. Those of an historical character or that possess an artistic interest have been arranged in the rooms.

The following may be specified as contributors:

Shepard Devereux Gilbert, Miss Dorcas C. Nourse, Charles T. Jenkins, Rev. Joseph Banvard, of Neponset, A. A. Galloupe, Beverly, T. F. Hunt, George Nichols, Chicago, Ill., Peabody Academy of Science, Estate of the late Samuel Johnson, Miss Lydia Pope, Raymond Lee Newcomb, Rev. William H. Halley, John Robinson, A. C. Orne, Marblehead, Charles H. Allen, Ellen and Robert Hale Bancroft, Beverly, John H. Langmaid, Mrs. Francis Dodge, Danvers, William M. Hill, Benjamin O. Pierce, Beverly, William P. Upham, Mrs. Eben Putnam, B. D. Hill of Peabody, Peter Thatcher, Boston, James B. Nichols, Mrs. James Kimball, Elbridge G. Putnam, Philadelphia, Joseph W. Stone, Rev. B. F. McDaniel, O. W. H. Upham, Mrs. Lydia C. Nichols, Rev. F. Israel.

The most important of the historical donations are, Door Latch from the old Parris House; piece of the root

of an apple-tree from the grave of Roger Williams; Baluster from the Old South Church, Beverly, Baluster from the Hancock House, Boston; First Shoe ever pegged by machinery; Spoon used on board the frigate Constitution; some of Gen. George Washington's hair.

FINANCIAL.— The Treasurer's Report of the receipts and expenditures of the past year (condensed for printing).

RECEIPTS.

| | | |
|---|---|---|
| Balance on hand at commencement of year | | $376 84 |
| *Hist. Soc. Fund.* | | |
| Dividends of stocks, | | 32 |
| *Nat. Hist. Soc. Fund.* | | |
| Dividends of stocks, | | 36 |
| *Davis Fund.* | | |
| Interest of bonds, | | 391 70 |
| *Ditmore Fund.* | | |
| Interest of bonds and stocks | | 180 40 |
| *Manuscript Fund.* | | |
| Interest of Savings Bank, | 23 02 | |
| Gift of Geo. Plumer Smith of Phila., | 50 | |
| | | 73 02 |
| *Ladies Fair Fund.* | | |
| Interest of bonds, | | 60 00 |
| *Howes Fund.* | | |
| Interest of bonds, | | 1,527 50 |
| *Story Fund.* | | |
| Legacy from the estate of the late Aug. Story, | | 10,000 00 |
| *General Account.* | | |
| Dividends of stocks, | 25 00 | |
| Return state tax, | 12 07 | |
| Assessments of members, | 905 00 | |
| Publications, | 741 31 | |
| Lectures, Concerts, Excursions, etc., | 429 81 | |
| Salem Athenæum, parts of bills | 197 51 | |
| | | $2310 70 |
| Sale of bonds | $2000 00 | |
| premium, | 134 50 | |
| | | 2,134 50 |
| Salem National Bank, Treasurer's note, | | 500 00 |
| | | $17,622 66 |

## EXPENDITURES.

| | | |
|---|---|---|
| *Historical.* | | |
| Binder's bill, | | 75 00 |
| *Natural History and Horticulture.* | | |
| Binder's bill, | | 75 00 |
| *Ditmore Fund.* | | |
| Annuity to F. I. Perkins, | 110 00 | |
| Amount omitted, 1879 and 1880, | 20 00 | |
| | | 130 00 |
| *Manuscript Fund.* | | |
| Interest and gift, added to fund, | | 73 02 |
| *Davis Fund.* | | |
| Interest added to fund, | | 11 70 |
| *Derby Fund.* | | |
| Deposits in Salem Savings Bank, | | |
| Reported on debit in last account, | | 400 00 |
| *Story Fund.* | | |
| Investments; transferred from the estate, | | 10,000 00 |
| *General Account.* | | |
| Salaries, | 2,168 61 | |
| Publications, | 1,459 13 | |
| Books and binding, | 185 75 | |
| Salem Athenæum, Rent and Libraries, | 350 00 | |
| Fuel, Gas, Express, Postage, etc., | 453 07 | |
| | | 4,616 56 |
| Paid note of Institute and interest since 1875, | | 2,186 74 |
| Balance, cash on deposit at Salem National Bank, | | 54 64 |
| | | $17,622 66 |
| The invested funds of the Institute are now, | | $15,766 78 |

In March, this year, the Institute acting in coöperation with several of the Historical Societies of this state, which were desirous to ascertain the condition of the various city and town records, sent a circular and also a carefully prepared blank form to each town and city clerk in Essex county, inviting their coöperation and requesting that the form be filled out in accordance with the instructions annexed, and returned to the Institute; also suggesting that great care be taken to make every statement precise and accurate especially as to the dates; these returns when collected and summarized, will be printed, constitu-

ting a valuable account of the records of our various municipalities.

The New England Historic-Genealogical Society, having appointed Mr. Henry F. Waters of Salem, an officer of the Institute, its agent in London for the purpose of making genealogical and historical investigations among the English records, and having called for funds in aid of this purpose, a committee, composed of Messrs. Rantoul, Emmerton and Hunt, was appointed to solicit subscriptions. The subject was brought to the notice of a few persons interested in Mr. Waters and his mission, and the sum of $525.00 was collected and sent to the committee of the above-named society, who have this duty in charge.

In closing this retrospect of the year's work of the Institute, the officers indulge in the hope, that, ere long its friends will devise some plan, by which suitable accommodations will be provided, for the proper arrangement of its library and collections.

# BULLETIN

OF THE

# ESSEX INSTITUTE.

VOL. 15. SALEM: JULY, AUG., SEPT., 1883. NOS. 7, 8, 9.


## NOTICE
## OF THE DEATH OF CHARLES TIMOTHY BROOKS.

AT the regular meeting, Monday, June 19, 1883, after the routine business was transacted, the President called the attention of the meeting to the recent death of Rev. Charles Timothy Brooks of Newport, R. I., a member of the Institute, and said that it seemed proper that some notice should be taken of his decease.

REV. E. B. WILLSON said that while he was not prepared to make a formal address at this meeting, he wished to pay his tribute of respect to the memory of Mr. Brooks, and to express his admiration of the high character and delightful Christian spirit of the deceased. He had known him intimately of late years, and deemed it a great privilege to have had such a friend. In the course of his remarks, Mr. Willson said that on the occasion of the North Church Centennial celebration Mr. Brooks had been most helpful in making it a success. He also said that he had made the death of Mr. Brooks the theme of his discourse on Sunday.

REV. E. C. BOLLES said that he was glad to add his word to endorse the remarks of the last speaker, and

moved that the President and Mr. Willson be a committee to prepare appropriate resolutions on the death of Mr. Brooks, also to arrange to hold at some later day, a more formal and an appropriate memorial service under the auspices of the Institute. The motion was unanimously adopted.

Mr. Albert G. Browne and Dr. George A. Perkins remarked on the kindly and genial disposition and spirit of Mr. Brooks, and gave some personal reminiscences of his life. Dr. Perkins said that they had been life-long acquaintances and were in early years schoolmates, and the friendship had never waned. In the year 1834 he made a journey on foot to the White mountains with Mr. Brooks. This jaunt was always pleasantly remembered by both of them, and was alluded to in their frequent meetings, and it had been the expressed intention of both Mr. Brooks and himself, that, if they lived, the fiftieth anniversary of that excursion should be passed by them on the top of Mt. Washington.

Mr. Robert S. Rantoul spoke of the literary character of the deceased and dwelt especially on his remarkable facility and genius in his translation of German poetry. He said:

In the death of Charles T. Brooks we have lost another of those sons of Essex County who have made a place for themselves in American letters. I never heard Mr. Brooks preach, and my estimate of his mental qualities is made up from sources quite apart from his efforts in the pulpit. I know him, as most of us have known him, through his occasional verses, through his translations, through his sunny face and his cordial greeting. He was successful as a translator. He had that fineness of appreciation,— delicacy of touch and fibre,—faculty for giving him-

self over without reserve to his author, a sort of literary self-renunciation, self-surrender, which is to my mind the *sine quâ non*, the beginning and end of successful effort to fairly interpret and render in good faith the spirit of another's work.

He had also the drollery, the love of the grotesque, the quiet, humorous enjoyment of the extravagant vagaries of German wit, of that sly fun that so pervades home life and street life in Germany, which made it easy for him to transfer that peculiar atmosphere to his American reprint. His "Max and Maurice," for instance, is, of its kind, inimitable. No one is too old, no one is too young, to laugh over it. But he was equally fortunate in his more serious efforts in German translation. I will not enumerate these works nor characterize them. The death of Freiligrath, the great revolutionary, democratic, people's poet of modern Germany,—the Burns, the Whittier, of the Teuton race, occurred while I was at Stuttgart, where he had been residing, and when the first anniversary of it came about, I was still at Stuttgart. In Southern Germany the custom is to celebrate the day of the death rather than of the birth of those to whom the world owes something, and this first anniversary of Freiligrath's death was noticed by the English and American residents of Stuttgart with memorial exercises in which many Germans, who understood English, united with the English-speaking admirers of the poet. He had lived much in England, had purposed emigrating to America whither he had already sent forward a pioneer in the person of his son, and was well acquainted with Longfellow (whom he had translated,) and with Mr. Brooks, and was read and admired by Whittier. I was asked to make the address on the occasion, and in that connection took some pains to seek out the best English translations of some of Freiligrath's characteristic poems.

From a considerable collection of English translations made by English, Scotch and Irish writers of note as well as by Mr. Brooks, I selected as best suited to my purpose one which I will read, and, lest my local partiality might mislead me as to the quality of Mr. Brooks' work, I consulted competent critics on the spot, including the family of the German poet himself, and found that they shared my preference. I read, from the published proceedings of the occasion, Mr. Brooks's version of

THE EMIGRANT'S DEPARTURE.

Ye men, that from your necks set down
  Your heavy baskets on the earth
Of bread, from German corn baked brown,
  By German wives, on German hearth,

And you, with braided tresses neat,
  Black Forest maidens, slim and brown,
How careful, on the sloop's green seat,
  You set your pails and pitchers down!

Ah! oft have home's cool, shady tanks
  Those pails and pitchers filled for you!
By far Missouri's silent banks
  Shall these the scenes of home renew,—

The stone rimmed fount,— the village street,
  Where oft ye stooped to chat and draw,—
The hearth,—and each familiar seat,—
  The pictured tiles your childhood saw!

Soon, in the far and wooded west,
  Shall log-house walls therewith be graced:
Soon many a tired and tawny guest
  Shall sweet refreshment from them taste:

From them shall drink the Cherokee,
  Faint with the hot and dusty chase.
No more from German vintage ye
  Shall bear them home in leaf-crowned grace!

Oh say! Why seek ye other lands?
  The Neckar's vale hath wine and corn:
Full of dark firs the Schwarzwald stands:
  In Spessart rings the Alp-herd's horn!

Ah! In strange forests you will yearn
For the green mountains of your home,—
To Deutschland's yellow wheat-fields turn,—
In spirit o'er her vine-hills roam!

How will the form of days grown pale
In golden dreams float softly by,
Like some old legendary tale,
Before fond memory's moistened eye!

The boatman calls! Go hence in peace!
God bless you,—wife and child and sire!
Bless all your fields with rich increase,
And crown each faithful heart's desire!

Rev. Fielder Israel referred to the help Mr. Brooks had been to him in many ways and endorsed the views of the previous speakers. He read some verses of the deceased, entitled, "A winter morning on the Merrimac."

Letters were read from Rev. B. F. McDaniel and Mr. William P. Andrews, regretting their necessary absence from the meeting.

Rev. Mr. McDaniel writes:—

"I regret very much that a previous engagement, which I cannot set aside, will prevent me from attending, this evening, the meeting in memorial of Mr. Brooks, whom to know was to see the kingdom of Heaven. I should rejoice to hear the loving tributes paid by those who knew him better than I did."

Mr. Andrews writes as follows:

Dear Dr. Wheatland,

It is a matter of sincere regret to me that I cannot be personally present with you on Monday evening, to render what little tribute I may to the worth of our dear friend, Mr. Brooks; and I beg you or Mr. Willson will kindly add my word to what may be said on that occasion.

"Half Lamb, half Cowper," Mr. Silsbee has most happily called our friend, and the thought is a picture of his blended wit and simple goodness.

Simplicity, and goodness itself were personified in his gentle, unobtrusive life; and as he lately read his tribute to Mr. Story in your hall, many of us must have been struck with the applicability of his poetic praise of Mr. Story's worth to his own. His appearance, his manner and matter on that occasion, must remain forever memorable to those who were fortunate enough to hear him.

The man himself was always a delightful poem, of which his fluent, tender verse hardly gives us a full report. None the less he lived in an atmosphere of poetry which, flowing spontaneously from his mind and pen, brightened and uplifted many sorrowing hearts, and adorned many a serious or gay assemblage.

It seems to me his greatest success in literature, however, was in his most difficult undertaking, the then untried rendering of the German masterpiece into English, in its original metres. Only those who have attempted that task, or carefully compared the leading translations word by word with the German text, can appreciate the difficulty of that accomplishment, or the remarkable success with which our poet has met it. However much the loudly-blown trumpet of praise may exaggerate the merits of another version of Goethe's Faust that owes a deep and yet unacknowledged obligation to Mr. Brooks' work; the fact remains that our friend's work has never been equalled by any published translation, in fidelity to the letter, or to the feeling of the original — a fact the leading journals have lately noticed, and which was admirably stated some years since in a formal article on the subject contributed to the "New Englander."

But while it is our duty to record here the debt under

which Mr. Brooks' faithful and loving labors in this, and many another admirable translation, have placed the literatures of the two great Teuton families, we must with mournful hearts acknowledge the personal obligation we all feel in recalling his gracious life of varied usefulness and beauty.

The charm of perpetual youth that surrounded his simple, unpretentious spirit; the warm appreciation of his friends, and ready word of kindly sympathy and encouragement; the delight of his cordial manner, and mellow flavor of his mingled wit and wisdom, made his annual return, to these his native haunts, always a memorable pleasure to all of us. He was indeed a MAN, whose like we may not look upon again.

I am, my dear sir, sincerely yours,

WM. P. ANDREWS.

The PRESIDENT gave some account of the class of 1832 at Harvard, of which Mr. Brooks was a member, and mentioned the interesting as well as remarkable fact that, in the year when Mr. Brooks entered college, twenty-four applicants from Salem were examined for admission to the various colleges, of whom nineteen obtained their degree in regular course: of the twenty-four, seventeen were admitted to Harvard, and thirteen of these graduated at the expiration of four years. This is probably an unparalleled record in the educational history of the city.

The following is a list of those admitted to the different colleges in 1828.

AMHERST. *James Oliver* left during the Freshman year; afterwards entered Colby University, receiving his degree in 1838. A teacher and joint author of "Wreck of the Glide;" died in Cambridgeport, Jan., 1845.

BROWN. *Joseph Farnum*, a physician and dentist, died in Salem, Nov. 22, 1874.

*Samuel Randall*, died at Madison, N. J., April 20, 1862, æt. 50, Rector of Episcopal Church in that town.

DARTMOUTH. *Richard Manning Chipman.*
*Edward Brown Emerson.*

HARVARD. *Haley Forrester Barstow*, a lawyer, died at Grand Rapids, Mich., Aug. 13, 1871.

*Charles Timothy Brooks*, the subject of this notice.

*George William Cleveland*, merchant, died at Pontotoc, Miss., Sept. 20, 1848.

*James Arthur Cleveland* was admitted, but did not join the class; artist, died at Tarrytown, N. Y., May 8, 1868.

*William Sewall Cleveland*, left at the close of the Sophomore year.

*William Fabens*, lawyer, died at Marblehead, March 11, 1883.

*John Forrester*, left during the Freshman year, engaged in mercantile pursuits, died Feb., 1841.

*William Prescott Gibbs*, lawyer, died in Lexington, Mass., July 27, 1852.

*Benjamin Manning Hodges*, left on account of ill health, at the close of the Freshman year, died at Salem, June 30, 1830.

*Charles Grafton Page*, physician, electrician, Examiner U. S. Patent Office, died at Washington, D. C., May 5, 1868.

*Archer Ropes*, lawyer in Baltimore, Md., died Oct. 2, 1855.

*John Boardman Silsbee*, merchant, died in Salem April 1, 1867.

*John Henry Silsbee.*

*William Silsbee.*

*Augustus Story*, lawyer, Pres. Holyoke Ins. Co., Salem, died Oct. 19, 1882.

*William Henry West*, lawyer, died at Indianapolis, Ind., August, 1838.

*Henry Wheatland.*

YALE. *Horace Lorenzo Conolly;* transferred his connections to Trinity college in the senior year and received his degree from that college. Authorized to take the name of *Horace Ingersoll*, Nov. 16, 1858.

*John Spencer Wallis.*

Of the above list, eight are now living after the lapse of fifty-five years from the time of admission. These are the four who entered Yale and Dartmouth, and four of those who entered Harvard. Of the twenty-four admitted to college in 1828, fourteen were from the Latin School in Salem, and the others from private schools.

# THE FIRST NOTICE OF THE PINE GROVE OR FOREST RIVER SHELLHEAP.

BY F. W. PUTNAM.

It now seems strange that any one could for a moment believe the great deposits of oyster, clam, quahaug and other shells along the seacoast, and of the fresh-water clam along our interior rivers, were formed by natural agencies, but fifty years ago they were almost universally considered as natural deposits; the result of upheaval of ocean beds or ancient beaches.

Dr. Ducatel, in his report on the geology of Maryland, pronounced the great heaps of oyster shells on the Chesapeake to be artificial productions, and he seems to have been the first geologist in this country to call attention to their true origin, which he did in the following words:—

"Some of the other agricultural resources of the state, besides those derived from the use of marl, have been already alluded to in the preceding sections. There is one especially, scarcely inferior in value to the marl, consisting of extensive accumulations of oyster shells, evidently made by the aboriginal inhabitants of the country; — since they are found to enclose human skeletons, deer horns, tools, coarse pottery, etc., plainly significant of their origin. The accumulations are found in many parts of the eastern shores and their principal localities are laid down in the map."—Report of J. T. Ducatel, State Geologist of Maryland, Dec. 29, 1834.

These deposits had been referred to by several of the

early writers on the habits of the Indians of the Atlantic coast as the refuse piles of the Indians, and even fifty years ago there were local traditions of their being the camping grounds of Indians, but these statements were not among the general possessions of the geologists, who were obliged to study these recent deposits in the same way that they studied the beds of fossils. Some fossil shell-beds were known, and as great stress had been laid upon the uprising of sea beaches, it became the accepted theory that all similar beds or heaps of shells were owing simply to the uprising of the coast.

In 1841 Mr. Lardner Vanuxem, a distinguished geologist on the New York Survey, made a communication before the meeting of American Geologists and Naturalists in which he gave his reasons for differing from Mr. T. A. Conrad, who seems to have persisted in the theory that the shell-beds were of natural origin,[1] and showed that the association of the shells with stone arrowheads and fragments of pottery proved their artificial origin, which was confirmed by the fact that the shell-beds were deposited upon the natural surface of the soil, and that under them were the remains of cedar trees which had formerly grown on the spot. Thus, seven years after the statement by Ducatel the question of the natural or artificial origin of the shellheaps was still under discussion.

In this connection, and with these facts before us, it is of interest to read in the unpublished records of 1840, of the Essex County Natural History Society, to which my attention was directed by the honored president of the Institute, Dr. Wheatland, the first account of the shellheap at Pine Grove, from which so many of us have ob-

[1] Vanuxem and Ducatel both agreed with Conrad in stating that some beds were of natural origin, but they were true fossils.

tained scallop shells in our younger days, when the place was famous as a picnic ground, and into which some of us have dug in after years, with a full knowledge of its Indian origin.

The record of the secretary's book of the society is headed "Report on the presence of shells in great quantities near the seashore in Salem, Mass., observed May, 1840, by John Lewis Russell."

From the record it appears that Mr. Russell addressed the society on the subject of raised beaches, and he quotes from several authors accounts of elevations of land in various parts of the world in recent times, caused by earthquakes, and also mentions several instances of raised beaches on which are great masses of shells. All these deposits, following the opinions of the authors he has quoted, he regards as natural formations. He then states that there have been found "strata of *Mya*, *Mytilus*, and *Ostrea*, several inches thick, from five to ten feet below the surface at Lechmere's Point in Cambridge," and that "S. C. Dana, M. D., the ingenious and accomplished chemist of Lowell . . . . found them on the site of the Court House [at East Cambridge] and has no doubt that they were raised to their present position from the adjacent beds of the harbor, of which the hill in question was probably at one time the shore of the then sea."[2]

After these preliminary remarks Mr. Russell comes to the special subject of the Pine Grove Shellheap, which he

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[2] The remains of an old shellheap were still visible at Lechmere's Point a few years since and probably can still be traced.

As an instance of finding shells at considerable depth along the old shore lines of Salem, I may mention that, when a boy, the old North River bank was graded at that part of Federal Street where now stand the houses built by Messrs. Haskell and Walden, and that in the old shore sand-bank, many shells of the large hen-clam, *Mactra solidissima*, were found. These were evidently shells which had been buried on the former beach of North River.

regarded as of natural origin, notwithstanding the singular association of several species of shells and bones of mammals. Had he continued to make the excavation which he mentions, to the bottom of the heap, his conclusions would probably have been entirely different. The record, however, is of interest as the first account of this now nearly effaced shellheap, and is here copied in full, as follows :—

"Having thus introduced you to these phenomena abroad, allow me to call your attention to similar in our own neighborhood and under our own eyes. Owing to the suggestion of an acquaintance I was induced to visit, in company with him, the southern shore of our harbor in that portion just east of the very picturesque group of pitch pines, contiguous to the Lead Factory of Mr. Francis Peabody. Any one who has ever rambled over the undulating hills of this spot is familiar with the indented features of the land. After passing over the crest of the hill about a fourth of a mile from where the Marblehead railroad enters the point after crossing the mouth of Forest River you descend into a valley, and at the elevation of several feet above its level, and probably more than twenty feet above high water mark, you will notice the appearance of broken shells protruding from the soil. Similar appearances exist on the shores of the Mill Pond above the Salem railroad bridge (at the foot of Circus street), but whether referable to the same agency, further examination can only determine.

"Digging into one of these spots we found an astonishing accumulation of shells in all stages of decay. Penetrating to the depth of more than four feet there seemed to be little indication that we had reached its bottom. Indeed it is not improbable from existing appearances that the bed was of indefinite extent. Specimens of

every kind of the mass were carefully saved, and are offered for the acceptance of the Society to be deposited in its cabinets.

"The greatest amount of specimens were of *Mya arenaria* or common clam. These were interspersed sparingly with *Modiola papuana*, *Mytilus edulis*, *Mactra solidissima*, *Nassa obsoleta*, *Natica heros*, *N. triseriata* and occasionally *N. duplicata*, *Fusus cinereus*, *Sanguinolaria fusca*, *Crepidula fornicata*, *Pecten concentricus*, *Ostrea* sp., upon the outside of which were minute and almost microscopic species of *Spirula*.

"You will take notice that the occurrence of the Oyster was quite rare. How this happens when its almost constant companion, *Pecten concentricus* was comparatively in abundance, I cannot explain. The oyster seems to have been an inhabitant of our northern coasts, but in sparse quantities. *Pecten concentricus* is found in company with the oyster on the southern shores as I have been informed, and indeed the exuviæ of our oyster shops are sufficient proofs of the fact, among which it is often seen. *Natica duplicata* also is peculiarly of southern habit, and belongs to a group of our maritime shells, whose living habitat is not considered as belonging to the northern shores of Cape Cod.

"But the most interesting discovery remains. This was the occurrence of fragments of bones, near the bottom of the penetration which we effected. They were in a very soft and friable condition, but became more hard and firm when exposed to the air. I have succeeded by the kind assistance of my friend, Dr. Jeffries Wyman of the Boston Natural History Society, in determining these to belong to some large species of deer, and the animal as of a young age. The existence of the fourth or fifth molar of the left lower jaw most indubitably points out

this fact, the teeth of the deer possessing a peculiar process which the teeth of no other animal have. This specimen I have retained, until I hear from a friend who is familiar with the history of our native deer. From its great size I think that it may belong to the moose, being somewhat larger than any tooth of the upper jaw of the elk or wapiti now in the cabinets of the Boston Natural History Society. That collection does not possess the lower jaw of the wapiti so that the corresponding tooth could not be compared with this. The other bones, five in number, compose some portion of the lower extremities of the right and left legs. They are :—[3]

"1. Fragment of the lower extremity of the tibia (right leg). The epiphysis is separated from the shaft of the bone, ossification not being complete.

"2. Astragalus.

"3. Os calcis. The posterior extremity broken off.

"4. A small bone situated between the lower extremity of the tibia and the upper lateral portion of the os calcis. This was an articulation with both these bones, and is supposed by Cuvier to represent the lower head of the fibula.

"5. Fragment of the left metatarsal bone. The outer condyle broken off.

"The first four bones fit accurately together and obviously belonged to the same foot.

"The want of coössification of the epiphysis of the tibia with its shaft, would indicate that the animal had not acquired its maturity. The metatarsal bone No. 5 was obviously that of a ruminant possessing originally two

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[3] The paragraphs numbered 1 to 6 are given in quotations in the record and are probably a copy of Dr. Wyman's notes on the specimens which he identified for Mr. Russell.

condyles, for the articulation of two sets of phalanges of the toes. It undoubtedly belonged to the same animal with the other bones, though it formed a part of the *right* foot and the others of the left.

" 6. The 4th or 5th molar of the left lower jaw.

"It remains only to add that occasional pieces of granite of the character with the super-adjacent rocks were dug up; these were very much decomposed and in some instances had actually become sand, owing to the presence of iron, and the action of water causing oxidization. At the surface, or just below it, of similar spots the shells were so decomposed as to resemble marl, and could be easily moulded by the hand. To the agriculturist these deposits may become rich means for the improvement of his soils, requiring only the labor of transportation to places where the action of carbonate of lime would be beneficial. Such has been actually the case with a similar elevation of recent marine shells in Hingham near the alms house, and these when spread over grass land, and even on old worn-out pastures have produced astonishing effects in the production of fine and healthy grass. The Hingham bed, with which I am familiar, is, however, different from ours, being completely thrown above the soil, and presenting the aspect of a vast heap of old oyster and clam shells, designedly thrown there by the hand of man. At some future opportunity I hope to be able to procure specimens from that locality to add them to the suite from the southern shore of our harbor."

# WEEDS OF ESSEX COUNTY.

BY JOHN H. SEARS.

A WEED is any plant which occupies cultivated ground to the injury of the particular crop intended to be grown. Thus, even the most useful plants may become weeds if they appear out of their proper place. The term is sometimes applied to any insignificant looking or unprofitable plants which grow profusely in a state of nature, as the fireweed, pigweed, mayweed, whiteweed, etc. There are weeds by the roadside, in gravel, brick and plank-walks, on railroad beds, in brooks, ponds and water courses.

By a system of natural selection some plants seem to thrive best in certain localities, as for instance the purselane. *Portulaca oleracea* is always found growing in cultivated grounds, while the common plantain (*Plantago major*) grows quite as abundantly in a hard, uncultivated situation. And again, the sorrel (*Rumex acetosella*) may be said to grow in either situation equally as well.

A large proportion of the plants called weeds are introduced from Europe, and as they are brought here with different kinds of crop seeds they become more or less adapted to the situation in which the seed is sown. And when the weed has perfected its seed, it will continue to thrive if the situation is a suitable one. Such plants as have become adapted to their surroundings usually grow in a like kind of soil and place, as there they thrive best, though a great many kinds of weeds have become so

thoroughly established that they grow equally well in a variety of situations. Plants also take a variety of forms from their situations and what they have to contend with in their season's growth.

The Roman wormwood (*Ambrosia artemisiæfolia*), found growing in cultivated ground, is usually two or three feet high, with a spread of two feet on the surface; while if grown in an old pasture where it is browsed on by cattle it will be found to take a form of one or two inches in height where it will thrive; and as the law of nature is for plants to mature seeds, one of these low, dwarfed plants will produce as many seeds as the larger plants grown in tilled ground. This often leads to the question asked by cultivators who, after ploughing and planting an old piece of pasture-land, find it thickly covered with the Roman wormwood, "Where do the seeds come from?" And as the full grown plant has not been detected by the casual observer for a series of years previous to the fields being planted, the query is made as to how long the seed has lain dormant in the soil.

Again, seeds of such plants as the Canada thistle (*Cirsium arvense*) and the fireweed (*Erechthites hieracifolia*) are furnished with a pappus of fine, soft hairs, which makes them very buoyant and easily transported by the wind to a great distance, and as such plants are very prolific, each plant producing thousands of seeds, when they do alight on cultivated or new burnt soil are immediately covered with the lighter material of which the soil is composed, and are ready to form a crop for the next season. Probably two-thirds of the seeds are dropped on grass lands and in woods where they never reach the soil, otherwise the country would soon be covered with these plants. I have arranged a classified list, with notes, of the weedy plants of Essex County, as follows:

### Order Ranunculaceæ.

Virgin's Bower, *Clematis Virginiana*, is a climbing plant, growing on fences and in moist, mowing lands. It is a troublesome weed.

Tall Meadow Rue, *Thalictrum Cornuti*, is a coarse growing weed in fresh meadows.

*Ranunculus acris*, tall Crowfoot or Buttercup, is very abundant and always avoided by cattle on account of its very acrid, blistering juice. European.

*Ranunculus bulbosus* and *R. repens* are equally abundant, and have similar properties. European.

### Order Berberidaceæ.

*Berberis vulgaris*, common Barberry.

This shrub was introduced from Europe, as a garden plant, for the sake of its berries. The seeds remain on the bushes all winter and supply food to the robins and other birds. They drop the seeds in fence rows and near stone walls, where they germinate and form large patches, which must be considered as weeds. They are fast covering our rocky pastures and are too abundant all over Essex County.

### Order Papaveraceæ.

Celandine, *Chelidonium majus*, is quite common in old gardens and near dwellings. It was introduced from Furope.

### Order Fumariaceæ.

Common Fumitory, *Fumaria officinalis*, is a weed in grain fields, and in some places a bad weed in grass lands. European.

### Order Cruciferæ.

Yellow Rocket, *Barbarea vulgaris*, grows in low lands and by roadsides. It is an European plant.

Hedge Mustard, *Sisymbrium officinale*, found in waste places and near dwellings. European.

Black Mustard, *Brassica nigra*, always grows in cultivated fields. European.

Shepherd's Purse, *Capsella Bursa-pastoris*, is common in grass and tilled lands. European.

Wild Pepper-grass, *Lepidium Virginicum*, a roadside weed, native of the Southern States.

Jointed Charlock, *Raphanus Raphanistrum*, is one of the worst weeds in old farm lands, as it is very prolific in bearing seeds. European.

### Order Cistaceæ.

Pinweed, *Lecheas*, of which there are three species, is a common weed in pasture lands.

### Order Hypericaceæ.

St. John's-wort, *Hypericum perforatum*, abundant in old pastures and fields. European.

### Order Caryophyllaceæ.

Bladder Campion, *Silene inflata*, a British species of the pink family, is spreading rapidly in many parts of Essex County. It is a deep-rooted plant. It is almost impossible to pull it up.

Common Soapwort or Bouncing Bet, *Saponaria officinalis*, escaped from gardens, is a roadside weed. European.

Corn Cockle, *Lychnis Githago*, a very pretty reddish-purple flower of the pink family, is a weed in grain fields. European.

Common Chickweed, *Stellaria media*, grows everywhere in damp grounds. European.

Mouse-ear Chickweed, *Cerastium viscosum*, a weed on lawns and in grass lands. European.

Pearlwort, *Sagina procumbens*, grows in damp places in brick walks often forcing the bricks out of place..

Sand Spurry, *Spergularia rubra*, var. *Campestris*, grows in similar situations to the last and in gravelly foot-paths.

Knawel weed, *Scleranthus annuus*, grows on railroad beds and waste places. Common. European.

Carpet weed, *Mollugo verticillata*, grows in cultivated ground, gravel walks, etc. From farther south.

### Order Portulacaceæ.

Purslane, *Portulaca oleracea*. This plant is the worst weed that the agriculturist has to contend with, as it seeds very fast, and is so tenacious of life, even after it has been cut up, taking root again. Its season of growth is also during the haying time, so that it gets a good start before it is observed. It is one of the oldest European pot-herbs.

### Order Malvaceæ.

Common Mallow, *Malva rotundifolia*, grows near dwellings and in garden paths. European.

Indian Mallow, *Abutilon Avicennæ*, a tall, coarse plant, escaped from gardens. From India.

### Order Geraniaceæ.

Wood-Sorrel, *Oxalis stricta*, grows around dwellings and in gardens. Common.

### Order Anacardiaceæ.

Poison Ivy, *Rhus Toxicodendron*, stone walls, climbing on trees, and in sandy fields.

### Order Leguminosæ.

Woad Waxen, *Genista tinctoria*. This plant was introduced from Europe, prior to 1628, as a dye plant. It is fast covering the uncultivated pastures in all parts of the county. It is a native of central and southern Europe.

Zigzag Clover, *Trifolium medium*, forms dense patches in Danvers and Salem. European.

Yellow or Hop Clover, *Trifolium agrarium*, sandy fields and roadsides. European.

Black Medick, *Medicago lupulina*, abundant in grass lands. European.

Vetch, *Vicia Cracca*, a very pretty plant, but a bad weed in mowed land, as it is hard to exterminate. Abundant at Danversport.

Wild Indigo, *Baptisia tinctoria*, abundant in old pastures.

Ground Nut, *Apios tuberosa*, grows on the edges of fields, and on walls and fences, climbing on the grass.

### Order Rosaceæ.

Canada Burnet, *Poterium Canadense*, a weed in fresh meadows and on river banks. Common in Danvers, Topsfield and Ipswich.

Cinque-foil, *Potentilla Norvegica*, grows in fresh meadows. It is a coarse weed.

High Blackberry, *Rubus villosus*, grows on the borders of thickets and wet meadows.

Low Blackberry, *Rubus Canadensis*, grows on rocky hills and pastures. Common.

Early Wild Rose, *Rosa blanda*, everywhere abundant in roadsides and fence rows.

Swamp Wild Rose, *Rosa Carolina*, common in wet meadows.

### Order Crassulaceæ.

Garden Orpine or Aaron's-Rod, *Sedum Telephium*, one of the worst weeds in grass lands. Abundant in Danvers, Wenham and Beverly. It increases principally by tubers, though even a leaf of it will take root if covered with soil. Kerosene oil will kill it.

### Order Onagraceæ.

Willow-herb, *Epilobium angustifolium*, found on new burnt land and in wet pastures, increasing rapidly by its seeds which have a tuft of long hairs at the end. The wind carries these seeds in all directions.

Common Evening Primrose, *Œnothera biennis*, a very persistent weed on roadsides, gravelly pastures and railroad beds.

### Order Cucurbitaceæ.

Star Cucumber, *Sicyos angulatus*. This plant is an introduced weed from the south. It is often used to cover trellises and walls near dwellings, but is a most troublesome weed in damp soils.

### Order Umbelliferæ.

Common Carrot, *Daucus Carota*, introduced into mowing lands. It seeds freely and is an unsightly weed. European.

Cow-Parsnip, *Heracleum lanatum*, is a very large, coarse plant. Found in pastures and near brooks.

Common Parsnip, *Pastinaca sativa*, common in mowed lands and increases very fast if neglected. European.

Great Angelica, *Archangelica atropurpurea*, damp fields and river banks. A coarse, strong-scented weed.

Poison Hemlock, *Conium maculatum*, a dangerous, narcotic, poisonous plant, growing by roadsides and in old gardens. This plant should be well known by all persons, as its seeds act very quickly, often producing paralysis when eaten.

### Order Compositæ.

Asters and Goldenrods. These pretty plants are weeds in fence rows, on the borders of fields and in pastures. They are hard to dislodge.

Horse-weed, Butter-weed, *Erigeron Canadensis*, grows on roadsides and in fields. Very common.

Roman Wormwood, *Ambrosia artemisiæfolia*. This weed is common in all parts of the United States east of the Rocky mountains. It is a compositæ, with sterile and fertile heads, occupying different parts of the same plant.

Spiny Clotbur, *Xanthium spinosum*, waste places on the seacoast, and established as a weed in Peabody and Danvers. From tropical America.

Cone Flower, *Rudbeckia hirta*, a common weed in mowing lands. It was introduced with clover seed from the west, and is native on the prairies of Wisconsin and southward.

Tick-seed, *Coreopsis trichosperma*, and common Beggar's Tick, *Bidens frondosa*, are coarse weeds, the seeds adhering to the dress and to the fur of animals, and are thus disseminated.

May-weed, *Maruta Cotula*, roadsides and dooryards. A very common weed. European.

Yarrow, *Achillea Millefolium*, waste places and around dwellings. Common. European.

Ox-eye Daisy, *Leucanthemum vulgare*, White weed, fields and pastures. Too abundant. European. In Hanson's history of Danvers, page 47, it is said that Edward Grover planted it in his garden as an herb in 1633 at Salem Village.

Common Tansy, *Tanacetum vulgare*, escaped from old gardens. Grows in dense patches by roadsides and in fields. European.

Common Everlasting, *Gnaphalium polycephalum*, grows everywhere in pastures and old fields.

Fire-weed, *Erechthites hieracifolia*, common in recent clearings where the ground has been burnt over.

Canada Thistle, *Cirsium arvense*, a most troublesome weed in hay fields. European.

Burdock, *Lappa officinalis*, waste places and around dwellings. It is an unsightly weed. European.

Cichory, *Cichorium Intybus*, a deep-rooted weed, and one that spreads very fast. Hay fields and roadsides; too common. European.

Hawkbit, Fall Dandelion, *Leontodon autumnale*, fields and roadsides, destroying the turf on banks and lawns. European.

Common Dandelion, *Taraxacum Dens-leonis*, grows in fields and pastures.

Blue or False Lettuce, *Mulgedium*, and Sow Thistle, *Sonchus*, are coarse weeds in cultivated swamp land.

### Order **Lobeliaceæ.**

Indian Tobacco, *Lobelia inflata*, in mowed land it is often abundant. In hay it causes horses to slaver, and is hurtful for cows to eat.

### Order **Plantaginaceæ.**

Common Plantain, *Plantago major*, near dwellings, yards and waste places. European.

Rib-grass English Plantain, *Plantago lanceolata*, grows in dry fields and lawns, its long thin leaves escaping the mower. European.

### Order **Scrophulariaceæ.**

Mullein, *Verbascum Thapsus*, roadsides, pastures and old fields. European.

Toad-Flax, Butter-and-Eggs, *Linaria vulgaris*, old fields and roadsides; very troublesome in grain fields. European.

### Order **Labiatæ.**

Motherwort, *Leonurus Cardiaca*, waste places and around dwellings. European.

### Order **Borraginaceæ.**

Viper's Bugloss, *Echium vulgare*, roadsides and waste places in Beverly, Danvers and Middleton. It is a bad weed in cultivated fields in Virginia. European.

### Order **Convolvulaceæ.**

Bind-weed, *Convolvulus arvensis*, abundant in Salem and vicinity, growing in dense mats and seeding rapidly. It is a perennial low climber, twining upon the grass and everything within its reach.

Hedge Bind-weed, *Calystegia sepium*, is another climbing weed, and

on tillage lands is one of the worst weeds, as it twines around young plants. It is especially abundant in Danvers, Salem and Marblehead.

Dodder, *Cuscuta Epilinum.* In Europe this plant is very injurious to the Flax. It is common in many parts of this county and is parasitic on the bark of Asters, etc.

### Order **Solanaceæ.**

Thorn Apple, *Datura Stramonium*, waste grounds. It is a dangerous, but well known weed, its seeds being a powerful emetic. From Asia.

### Order **Phytolaccaceæ.**

Garget or Pigeon-berry, *Phytolacca decandra*, tall and stout perennials, growing on burnt land and reclaimed swamps. The stout stalks are eaten as a substitute for asparagus in early spring.

### Order **Chenopodiaceæ.**

The Pigweeds, *Chenopodium album*, etc., are all naturalized from Europe. The beet and spinach are in the same family.

### Order **Amarantaceæ.**

Green Amaranths or Sugar-weed, *Amarantus.* There are three species, all natives of tropical America.

### Order **Polygonaceæ.**

*Polygonum*, Knot-weeds, we have thirteen species growing as weeds in the county. Those commonly known are called Smart-weed, the Arrow-leaved Tear-thumb, Goose-grass, Water pepper, Lady's Thumb with a dark spot in the leaf, and are among the best known.

Curled Dock, *Rumex crispus*, fields and roadsides. Common. European.

Yellow Dock, *Rumex obtusifolius*, fields and roadsides. Common. European.

Field or Sheep Sorrel. *Rumex acetosella*, everywhere abundant.

### Order **Euphorbiaceæ.**

Spurge, *Euphorbia maculata*, grows in open places everywhere, especially in gravel walks.

### Order **Urticaceæ.**

Nettles, *Urtica dioica*, waste places and roadsides. European.

Rich-weed or Clear-weed, *Pilea pumila*, grows in cool, moist shady places in old gardens.

*Cannabis sativa*, Hemp, waste places, roadsides, etc. Abundant at Newburyport.

Sweet Fern, *Comptonia asplenifolia*, pastures and roadsides.

### Order **Salicaceæ.** Willow Family.

There are several shrubby species that we may consider as weeds. *Salix livida*, quite common in dry soil in pastures and fields. *Salix humilis*, Prairie Willow, and *Salix discolor*, Pussy Willow, are abundant as roadside weeds in damp places. *Salix sericea*, Silky Willow, and *Salix lucida*, Shining Willow, are common by streams and ponds, their long roots often filling them up and choking water courses.

### Order **Coniferæ.**

Common Juniper, *Juniperus communis*, dry, sterile hills and pastures.

### Order **Araceæ.**

Skunk Cabbage, *Symplocarpus fœtidus*, moist, springy fields and near brooks. Its coarse, fibrous roots are hard to dig up.

### Order **Naiadaceæ.**

Pond weeds, *Potamogetons*, of which there are several species, are abundant in ponds and streams, sometimes completely filling up and changing water courses.

### Order **Iridaceæ.**

Blue Flag, *Iris versicolor*, in wet meadows.

### Order **Smilaceæ.**

Green-brier, *Smilax rotundifolia*, grows abundantly on the borders of woods and thickets, and on account of its tough roots and formidable scattered prickles, it is hard to eradicate.

### Order Liliaceæ.

American White Hellebore, Indian Poke, *Veratrum viride*, swamps and low grounds. Common.

Onion or Field Garlic, *Allium Canadense*, is a vile weed giving its alliaceous flavor to all plants grown in its vicinity. Common. European.

### Order Pontederiaceæ.

Pickerel weed, *Pontederia cordata*, common in ponds, brooks and streams.

### Order Gramineæ.

Cheat or Chess, *Bromus secalinus*, one of the European grasses common in rye and oat fields. There are four species, all European.

Dog-grass, *Triticum repens*, in cultivated grounds, fields, etc. Its long, underground stems cause much trouble to gardeners.

Joint-grass, *Paspalum setaceum*, common in light soils, first showing itself in August on tillage grounds. Growing in mats it is difficult to pull out of the soil, as it breaks easily at the joints.

Panic-grass, *Panicum sanguinale*, has habits like the last, and is abundant in all cultivated and waste ground. European.

Old Witch-grass, *Panicum capillare*, common in sandy, cultivated fields.

Barnyard-grass, *Panicum Crus-galli*, is a native of the south of Europe, and one of the principal forage plants in Italy. With us it is a troublesome weed.

Foxtail-grass, *Setaria*. Three species exist here. Very common near dwellings and in cultivated fields. They are usually very weedy grasses, resembling the Millet, which is another species rarely spontaneous.

Beard-grass, *Andropogon furcatus*, and *scoparius*. These two grasses are abundant in dry, sterile grounds and roadsides.

### Order Equisetaceæ.

Horsetail, *Equisetum arvense*, is common in moist, gravelly soil and on railroad beds where it is a troublesome weed. *Equisetum sylvati-*

*cum* grows abundantly in wet meadows, and *Equisetum hyemale* the Scouring Rush, on river banks and near brooks. They are all weeds on reclaimed meadow-land. When cut and dried with hay, cows eat them with a greedy relish.

### Order **Filices.**

Ferns. There are several species which are considered as weeds: *Osmunda regalis, Osmunda Claytoniana, Osmunda cinnamomea, Pteris aquilina* and several species of *Aspidium* are all called Buckhorn, Brake, etc. They are all noxious weeds, being poisonous to young horses when mixed with hay, and they are not relished by other cattle, though goats will thrive on them better than on English hay.

### Order **Musci.**

The Mosses are small plants not distinguishable except by the botanist. The Hair Cap Moss, *Polytrichum commune*, in dry, sterile pastures, covers many acres, forcing the grass out entirely and leaving a complete carpet of the moss. Some species of *Hypnum* will persist and make a rapid growth even in cultivated fields; others are parasitic on the bark of trees and are injurious to orchards as hiding places for insects.

### Order **Lichens.**

Lichens are parasitic on dead wood and decayed vegetable matter. The Reindeer Moss, *Cladonia rangiferina*, completely covers some sections of our old pasture-land in Danvers and Wenham, making them entirely destitute of other vegetable growths and worthless as grazing land. Other lichens on trees in the orchard and in the woods form hiding-places for insects, where they deposit their eggs.

## FIELD MEETING AT OAK DELL, GEORGETOWN.

The first field meeting of the season was held at Oak Dell, on Tuesday, June 13, 1883. It is a picturesque spot in South Georgetown, as its name signifies, an oak grove. A beautiful pond is within easy walking distance, and the surface is pleasantly diversified. The proprietors have taken advantage of the natural attractions of the place in order to adapt it to picnics and other gatherings.

A raised platform for speakers and seats for an assembly of two hundred are placed under the oaks, and near by, a cook-house and tables for refreshments. The party from Salem and vicinity went in barges and carriages, and were joined at the grounds by others from Danvers, West Newbury, Boxford, Georgetown and Groveland. Exploring parties were at once formed, the botanical work alone promising good results. Mrs. Charlotte N. S. Horner chiefly conducted this part of the work; others visited the lake and other points of interest. At 2 o'clock P. M., the meeting was held in the grove, President Wheatland presiding, who prefaced the exercises with remarks on the utility of field meetings and the pleasant auspices under which this one was held. Mrs. Horner was introduced as one highly conversant with natural history, and who has devoted herself to the study of the flora of Essex County, especially of her own district, Georgetown and vicinity.

She exhibited and described a number of plants collected in the forenoon's ramble, indigenous to the locality. She considered this a rare field for botanical study, and stated that more species of plants can be found in it than in any other district of equal extent in the county.

A list of the more important and interesting plants of the higher orders found by her in Georgetown has been prepared by Mrs. Horner, and will be found appended to this report.

Rev. William P. Alcott, of Boxford, being called upon, spoke of the lichens as worthy of study both for their beauty, botanical interest, and the part they play in the economy of the vegetable world. He also spoke of the study of mineralogy, and exhibited some specimens of rocks and minerals which he had brought from Egypt.

Rev. Benj. F. McDaniel, of Salem, took up the subject left by Mr. Alcott, and gave a brief outline of the region, regretting that the rock exposures in the vicinity were so few and uniform in character as to leave little for him to say. He urged the importance of the study of geology, even in such an unpromising field, and asked for the coöperation of local students in bringing the hidden things to light.

In answers to questions, he gave a brief account of the formation of peat bogs and their transformation, through several stages, into coal.

Messrs. Sidney Perley, of Boxford, and Henry M. Nelson, of Georgetown, spoke on historical matters relating to the town, Mr. Nelson stating that Oak Dell was a part of a large tract of land, an original grant to his ancestors.

Messrs. Andrew Nichols, of Danvers, M. W. Bartlett, of West Newbury, and Dr. B. F. Stevens, of the Boxford Natural History Society, made brief remarks.

After the usual votes of thanks to Miss Nelson and the Messrs. Nelson for the use of the grounds and other courtesies received, and to Messrs. Elliot, Perley, Mrs. Horner and others who contributed to the success of the meeting, the parties separated for their journeys homeward.

# NOTES ON THE FLORA OF SOUTH GEORGETOWN.

BY MRS. CHARLOTTE N. S. HORNER.

Following is a list of plants that are found on the shores and in the meadows and pastures bordering on Lake Raynor, South Georgetown, and a short distance beyond the Boxford line; but all within a half mile of the lake.

Many of the plants enumerated in this list are very common everywhere, and others are more or less frequently found in other localities; but some are found here that are rare elsewhere in the county. These are printed in italics, and their home is the small district described above. There is a small locality at the base and on the sides of some precipitous hills where are found an unusual number of rare plants. The most noteworthy of these are marked in the list with an asterisk(*). In this district are many pond weeds, grasses, sedges, mosses and lichens not found elsewhere in the town; but these are not enumerated in the list.

Clematis Virginiana.
Anemone "
" nemorosa.
Hepatica triloba.
Thalictrum anemonoides.
" dioicum.
" cornuti.
Ranunculus abortivus.
" recurvatus.
" bulbosus.
" acris.
Caltha palustris.
Coptis trifolia.
Aquilegia Canadensis.
*Actæa rubra.*
" *alba.*
Berberis vulgaris.
*Caulophyllum thalictroides.**
Nymphæa odorata.
Nuphar advena.
Sarracenia purpurea.
Sanguinaria Canadensis.
Cardimine hirsuta.
Viola lanceolata.
" blanda.
" cucullata.
" " var. cordata.
" pubescens.
Helianthemum Canadense.
Lechea major.
" minor.
Hypericum Canadense.
" perforatum.
" Sarothra.

Geranium maculatum.
Impatiens fulva.
Oxalis stricta.
Rhus glabra.
" copallina.
" venenata.
" Toxicodendron.
Vitis labrusca.
Ampelopsis quinquifolia.
Celastrus scandens.
Acer saccharinum.
Polygala sanguinea.
" *polygama.*
Desmodium nudiflorum.
Amphicarpæa monoica.
Lespedeza hirta.
" capitata.
Apios tuberosa.
Baptisia tinctoria.
Prunus maritima.
" serotina.
Spiræa salicifolia.
" tomentosa.
Agrimonia Eupatoria.
Potentilla Canadensis.
Fragaria Virginiana.
*Rubus odoratus.**
" strigosus.
" occidentalis.
" villosus.
" Canadensis.
Rosa lucida.
" rubiginosa.
Pyrus arbutifolia.
Saxifraga Virginiensis.
Sedum Telephium.
Hamamelis Virginiana.
Circæa Lutetiana.
Epilobium augustifolium.
" coloratum.
Œnothera biennis.
" pumila.
Hydrocotyle Americana.
Cicuta maculata.
*Aralia racemosa.**
Aralia nudicaulis.
Cornus Canadensis.
" sericea.
" paniculata.
*Triosteum perfoliatum.*
Sambucus Canadensis.
Viburnum Lentago.
" acerifolium.
Mitchella repens.
Houstonia cærulea.
" *purpurea*, probably introduced with grass seed.
Galium asprellum.
Cephalanthus occidentalis.
Liatris scariosa.
Eupatorium purpureum.
" perfoliatum.
" *ageratoides.**
Sericocarpus conyzoides.*
Aster corymbosus.
" patens.
" lævis.
" undulatus.
" multiflorus.
" dumosus.
" Tradescanti.
" acuminatus.
Diplopappus linarifolius.
" umbellatus.
Solidago bicolor.
" *latifolia.**
" cæsia.
" neglecta.
" nemoralis.
" Canadensis.
" lanceolata.
Inula Helenium.
Rudbeckia hirta.
Helianthus devaricatus.
Bidens frondosa.
Maruta cotula.
Achillea millefolium.
Leucanthemum vulgare.
Gnaphalium polycephalum.
" uliginosum.

Antennaria margaritacea.
" plantaginifolia.
Erechthites hieracifolia.
Senecio aureus.
" " *var. obovatus.*
Cirsium lanceolatum.
" pumilum.
Krigia Virginica.
Leontodon Autumnale.
Hieraceum scabrum.
" venosum.
Nabalus albus.
Taraxacum Dens-leonis.
Lobelia cardinalis, spike of 2 feet.
Lobelia inflata.
Gaylussacia resinosa.
Vaccinium macrocarpon.
" Pennsylvanicum.
Cassandra calyculata.
Andromeda ligustrina.
Kalmia augustifolia.
Rhodosia Canadensis.
Azalea viscosa.
Pyrola rotundifolia.
" elliptica.
" chlorantha.
" secunda.
*Moneses uniflora.*
Chimaphila umbellata.
" *maculata.*
Monotropa uniflora.
" Hypopitys.*
Ilex verticillata.
Trientalis Americana.
*Lysimachia thyrsiflora.*
" lanceolata.
" stricta.
" quadrifolia.
Utricularia cornuta.
*Epiphegus Virginiana.**
Verbascum Thapsus.
Linaria Canadensis.
" vulgaris.
Chelone glabra.
Mimulus ringens.
Gratiola aurea.
Gerardia purpurea.
" *flava.*
*Castilleia coccinea.*
Melampyrum Americanum.
Verbena hastata.
" urticifolia.
*Phryma Leptostachya.*
Mentha viridis.
" Canadensis.
Lycopus Europæus.
*Pycnanthemum muticum.*
" lanceolatum.
Hedeoma pulegioides.
Brunella vulgaris.
Leonuras cardiaca.
Scutellaria galericulata.
" lateriflora.
*Echium vulgare.* Two or three plants in a hayfield not permanent.
Myosotis verna.
Convolvulus arvensis.
Cuscuta Gronovii.
Solanum Dulcamara.
Gentiana crinita, plant 2 feet with 45 blossoms and buds.
Gentiana Andrewsii.
Menyanthus trifoliata.
Apocynum androsæmifolium.
Asclepias Cornuti.
" purpurascens.
" incarnata.
Phytolacca decandra.
Sassafras officinale.
Lindera Benzoin.
Comandra umbellata.
Euphorbia maculata.
*Ulmus fulva.**
" Americana.
Platanus occidentalis.
Juglans cinerea.

Carya alba.
" porcina.
Quercus alba.
Fagus ferruginea.
Corylus Americana.
Ostrya Virginica.
Myrica Gale.
" cerifera.
Comptonia asplenifolia.
Betula lutea.
" alba var. populifolia.
" papyracea.
Alnus serrulata,
Salix alba.
Populus tremuloides.
Pinus rigida.
" Strobus.
Abies Canadensis.
Juniperus communis.
Arisæma triphyllum.
Peltandra Virginica.
Typha latifolia.
Sparganium eurycarpum.
Alisma ptantago.
Habenaria lacera.
" psycodes.
" fimbriata.
Goodyera repens.*
" pubescens.
Spiranthes cernua.
" gracilis.
Arethusa bulbosa.
Pogonia ophioglossoides, a *white variety.*
Calopogon pulchellus.
*Corallorhiza multiflora.**
Cypripedium acaule.
Hypoxis erecta.
Iris versicolor.
Sisyrinchium Bermudiana.
Smilax rotundifolia.
" herbacea.
Trillium cernuum.*
Medeola Virginica.
Smilacina racemosa.
" bifolia.
Polygonatum biflorum.
Lilium Philadelphicum.
" Canadense.
Pontederia cordata.

*Filices.*

Polypodium vulgare.
Adiantum pedatum.*
Pteris aquilina.
Asplenium Trichomanes.*
" ebeneum.
" Filix-fœmina.
*Phegopteris hexagonoptera.*
Aspidium Thelypteris.
" Noveboracense.
" spinulosum.*
" cristatum.
" marginale.*
" acrosticoides.*
" var., incisum.*
*Cystopteris fragilis.**
*Struthiopteris Germanica.**
Onoclea sensibilis.
Woodsia obtusa.
Dicksonia punctilobula.
Osmunda regalis.
" Claytoniana.
" cinnamomea.
Botrychium Virginianum.*
" ternatum, var. australe? *fine* specimens.
Botrychium ternatum var. obliquum.
Botrychium ternatum var. dissectum.
Equisetum arvense.
Lycopodium lucidulum.
" dendroideum.*
" clavatum.
" complanatum.
Selaginella rupestris.*
" apus.

# BULLETIN

OF THE

# ESSEX INSTITUTE.

VOL. 15. SALEM: OCT., NOV., DEC., 1883. NOS. 10–12.


## FIELD DAY AT DODGE'S MILL, ROWLEY, FRIDAY, JUNE 29, 1883.

THE party from Salem went to Ipswich in the morning express train, and by carriages to the place of meeting, some five or six miles distant. At Ipswich, a passing call was made at the Manning High School, where there is a fine mineralogical collection, also specimens representing other departments of natural history. The mill is about three miles from Rowley village in the direction of Georgetown and near to the limits of Byfield. It is upon the Dummer stream or brook, and it is owned by Mr. Ignatius Dodge; in whose imnediate family it has been since 1772, and perhaps from an earlier date.

Members and friends assembled soon from Georgetown, Boxford, Ipswich, Rowley and Groveland. Tables were prepared on a sequestered little island formed by the running brook. Some of the party under the guidance of Mr. Sears went on a botanizing excursion in the neighborhood; others drove a couple of miles to a hill on which there are vestiges of supposed Indian earthworks.

This hill, known as Hobson's Hill, is owned by Joshua N. Foss. It stands out alone and commands a good view

of the surrounding country to points from three to ten miles distant. The hill lies in part within the precincts of the Byfield parish, which is bounded by the Dummer stream. The principal object in visiting the summit of the hill was to examine a long but very low embankment and ditch extending nearly in a straight line over the hill to the low land. Mr. Foss discovered this line and supposed it to be Indian work, partly, perhaps, because of evidence that the place was a resort of the Indians many years ago.

Mr. Putnam said that the work bore some resemblance to an Indian trail, but its abrupt termination was not favorable to that theory, and he thought a careful examination of the place was required before an expression of opinion would be of any importance.

After the noon repast, the company repaired to the saw mill where comfortable seats were improvised for the accommodation of those attending the afternoon session.

President Wheatland introduced the exercises with a few observations relating to the various circumstances under which the field meetings are held.

Mr. John H. Sears exhibited and remarked upon specimens of the following plants which had been collected during the day:

Actæa spicata, var. rubra (Red Bane Berry).
Thalictrum cornuti (Tall Meadow Rue).
Magnolia glauca (Small Magnolia).
Nuphar advena (Cow Lily).
Corydalis glauca.
Sarracenia purpurea (Pitcher Plant).
Fragaria virginiana (Strawberry).
Rosa lucida (Wild Rose).
Cornus sericea (Round-leaved Cornell).

Cornus alternifolia.
Cornus circinata.
Nyssa multiflora (Tupelo or Sugar Gum Tree).
Rudbeckia hirta (Cone Flower).
Leucanthemum vulgare (White Weed).
Specularia perfoliata (Venus' Looking Glass).
Vaccinium macrocarpon (Cranberry).
Kalmia latifolia (Large Laurel).
Kalmia angustifolia (Sheep Laurel).
Rhododendron rhodora (Rhodora).
Pyrola chlorantha (Winter Green).
Pyrola rotundifolia (Winter Green).
Chimaphlia umbellata (Prince's Pine).
Linaria canadensis (Toad Flax).
Brunella vulgaris (Self-heal).
Cynoglossum officinale (Hound's Tongue).
Calystegia sepium (Hedge Bind Weed).
Apocynum androsæmifolium (Dogbane).
Ostrya virginica (Hop Horn-beam).
Peltandra virginica (Arrow Arum).
Habenaria virescens (Orchis).
Habenaria fimbriata (Great Purple Orchis).
Pogonia ophioglossoides (Pogonia).
Hypoxis erecta (Star Grass).
Sisyrinchium bermudiana (Blue-eyed Grass).
Allium canadense (Field Garlic).

Vice President F. W. Putnam was introduced and made some very interesting remarks on archæological subjects. These have been arranged in an illustrated paper and will be inserted at the close of this volume.

The President then introduced Mr. John Robinson with a reference to the Museum at Salem, in which collections have been going on for eighty-four years.

Mr. Robinson spoke of the earlier collection of specimens from the South Sea Islands and the East Indies by the East India Marine Society, and those of later date,

chiefly zoölogical specimens, by the Essex Institute, all of which are now permanently deposited with the trustees of the Peabody Academy of Science and are arranged in the cabinets in the East India Marine Hall, Salem, where they are on free exhibition every day to the public.

The Academy has lately given especial attention to perfecting the collections representing the geology, botany, zoölogy and prehistoric relics of Essex County and nearly every species of the flora and fauna of this region may now be seen there, also specimens of its mineralogy and geology. The collection of prehistoric or "Indian relics" is also very large and displayed in the best manner.

This Museum is county property and the people of the county should realize their rights and privileges in this ownership. To make this museum as perfect as it is desired it should be, the coöperation of our citizens is earnestly solicited by the trustees in charge. It is their wish to do all in their power for the instruction of visitors to the collections, and they have the means and facilities to care for all accessions which are made.

Mr. Alfred Osgood, of Newburyport, made some general remarks upon the different forms of arrowpoints, and expressed some theories of his own upon the origin and use of the several forms.

Hon. N. A. Horton, of Salem, was the last speaker, and, in closing, offered the following vote which was unanimously adopted.

*Voted.* That the thanks of the Essex Institute are tendered to Messrs. Ignatius G. Dodge, Phineas Dodge, Harrison Nelson, W. Walker, Mrs. Hubbard, and others of the vicinity for the many kind attentions of the day, also for abundant refreshment at the noon lunch. Adjourned.

## A Day at Linebrook, Thursday, July 26, 1883.

This is a rural country village situated in the western part of the township of Ipswich, and is about the same distance from the principal settlement as from Boxford and Topsfield; some of the people receive their mail matter in the latter town.

The party from Salem went in carriages; delegations from towns in the vicinity were also present. Soon after the arrival, a large number joined the botanical ramble under the guidance of Mr. John H. Sears; others went at will over the hills and valleys to see places of interest in this pleasant locality.

The noon-day repast was partaken of in a beautiful grove not far from the village church, which at 2.30 P. M. was well filled with an attentive audience; the President opened the meeting with some preliminary remarks on the general subject of field meetings, and said that the three meetings held this season were in places which the Institute had visited for the first time, an unusual experience in its history.

Mr. John H. Sears, of Salem, described the flora of the neighborhood, which, he said, is so varied, that a large portion of the plants indigenous to the county can be found here. He exhibited quite a long list of those that had been collected during the day.

Mr. M. V. B. Perley, of Linebrook Parish, read a communication which he had prepared, giving some interesting facts concerning the parish which is an old settlement, dating back to about 1636, an abstract of which is herewith appended.

Rev. B. F. McDaniel, of Salem, made an humorous reference to his attempt to reach "Pulpit Rock," which he presumed, from a specimen taken from it, was a kind of porphyry common to the neighborhood. He said there was much to be seen and investigated, in a geological point of view in the stone walls hereabouts, and gave advice in the direction of encouraging geological and mineralogical investigation. He suggested that specimens of the various rocks in the town be collected and sent to the Museum of the Peabody Academy of Science in Salem, and he promised to do his part in arranging the same.

Mr. Sidney Perley, of Boxford, was the next speaker, He made a lengthy presentation of the state of society that preceded the Revolutionary period, especially referring to the houses, domestic appliances, food, dress, education, etc.

Hon. J. J. H. Gregory, of Marblehead, made some practical suggestions about our common weeds. He said that some botanist should make a specialty of weeds common to our pastures and fields, and give the benefit of his observations to the farmers and people of the county.

Mr. A. C. Perkins, formerly of the Phillips Academy, Exeter, spoke of the importance of habits of observation among the young, and how satisfactory it is to know a plant or flower when seen. He told the story of the country storekeeper, who placed on his counter a nicely arranged bunch of the blossoms of the common potato plant, and then as the farmers, his customers, generally came to his store, he asked them if they could tell him what the flower was? Of course, all of them had seen the potato blossom year after year, but no one recognized it and wondered what the beautiful specimens were.

Mr. Perkins said that such meetings were of great

value to the people, and he invited the persons present to examine their closets and garrets, and send printed or written historical or genealogical matter to the Institute for preservation, mentioning instances of papers, thus found, that were of great value and importance to the student in history.

Hon. N. A. Horton, of Salem, said a few words respecting the parish of Linebrook and its connection with the witchcraft troubles in 1692.

The Secretary offered a vote of thanks to the people of Linebrook for their kind attentions, and also for the use of the church for the purposes of the meeting. After an unanimous adoption, the meeting adjourned.

The people of Linebrook seemed to have taken a great interest in this meeting; men, women and children turned out *en masse* during the day, while at the afternoon meeting there was a large attendance. It was the generally expressed opinion that the gathering was one of more than ordinary interest and enjoyment.

## A PEN-RAMBLE IN LINEBROOK.

BY M. V. B. PERLEY.

This is ancient territory. There were vested rights, upon the southeast, as early as 1635 or 6. Before 1653 Ipswich-Linebrook was all improved. The earliest owners were Batchelder, Winthrop, Norton, Foster, Payne, Jacobs, etc. The earliest settlers were Batchelder, Foster, Sherwin, Howe, Perley, Fowler, Davis, Grant, Burnham, Cooper, Burpee, Tenney, Pingree, Kimball, Chapman, Dodge, Jewett, Dresser, etc.

The earliest settlements were upon the south and north where the rivers led. It has always been a farming community. The surface is agreeably diversified with hills, plains and meadows. Hunsley hill upon the northeast, 300 feet above the level of the sea, is the highest elevation in the county, except Baldpate in Georgetown, 392 feet, and Holts hill in Andover, 423 feet. Upon Hunsley's summit, a tree, which was used by the United States government as a beacon for many years, was destroyed by the wind some ten years ago. The plain land is somewhat sandy and not now particularly adapted to farming. When the soil was new it was very satisfactory for raising the cereals, and our early ancestors sought and valued it for corn, wheat, flax and others. The valleys are rich and fertile. The meadows were highly prized by the settlers, for they were the principal source of feed for their cattle in winter. One hundred and twenty-five years ago Mr. Job Pingry owned three thousand acres of this territory.

Within our southwestern border is Hood Lake, fifty acres of beautiful water, lately stocked with choice fishes.

Near the site of the ancient church is "pulpit rock," having a perpendicular frontage of some ten feet, overlooking a broad plain, where Rev. George Whitefield electrified the multitude with the spirit of his power, as he reasoned of righteousness, temperance, and a judgment to come. Near the present church is one of the largest barns in the county, 120 by 41 feet, with excellent equipments. Opposite this barn is the site of the old garrison and tavern, where at a militia election the successful candidate was accidentally shot by his opponent, who was tried and convicted, but pardoned by the Governor before sentence was pronounced; and where upon an election day a Mr. J. P. climbed the flag-staff, unaided, to the top of the mainstaff, for the reward of a bowl of punch that had been placed there by means of ladders. Having reached the top and secured the prize, he offered to share it with any who might earn it as he had. Several attempts with as many failures made him

> Monarch of all he surveyed
> With rights that none could dispute.

Early in the present century there was the very eccentric sign of a very eccentric man. It has found its way into literature, and has been told as an entertaining story by travellers far and wide. His title was corporal, his trade blacksmith, his business landlord, and his sign:

> "I shoe the horse, I shoe the ox;
> I carry the nails in my box;
> I make the nail, I set the shoe,
> And entertain some strangers too."

At times he would not reply when questioned unless addressed by his title. He was as obliging and generous as he was eccentric.

During the Revolution, report said one day that the enemy was sailing up Batchelder's brook, and men, wo-

men and children fled for their lives. But one Dresser, whom they met, called them fools and deliberately taking out his pipe and lighting it, said, "I'll take a little smoke before they get here." They did not come, but we are not to infer that he is smoking now.

One of our most substantial, practical, influential and valuable citizens, in general business and town affairs, was Phineas Nelson Dodge, for many years selectman and assessor, and several times elected special supervisor and commissioner in valuations and expenditures of large sums of money.

Rev. Samuel Perley was born here — a graduate of Harvard College, an able preacher, and a member of the convention that ratified the Federal Constitution, and voted for its adoption. Here, too, was born Rev. Nathaniel Howe, uncle of our present pastor, a graduate of Harvard College, a preacher of Hopkinton, and noted for his originality, incisive diction and hard logic. Linebrook fought in the Indian wars, in the Revolution, in the war of 1812, and furnished some fifteen or twenty soldiers against the Rebellion.

But what of the parish as such? Of what use is it when churches and ministers are not particularly necessary to lead the great majority in the contemplation of truth; when saving truth is uttered only by the most popular preachers; when converts can be made on a Sunday pleasure-ride, as in a prayer-room; when seasides and groves are as hallowed, as the place where prayer is wont to be made? Of what use when men, *therefore*, are under no especial obligation to support it, except as a matter of charity to the church; and tire so much during the week in the service of the world, that they feel too tired to serve God on Sunday? There is little use of it, and there is a corresponding ignorance of its function. But there

was a time when the parish had its use; when every man understood and obeyed its precept or felt its rod of correction; when the parish was a power for good in social life and moral conduct, to say nothing now of the exemplary piety fostered by that old regime. There was a time when a man should labor six days and rest on the seventh; when he must belong to some parish, must contribute proportionally of his substance for the gospel support, must be in his place of worship, with his family, on Sunday, or give a good and substantial reason for his neglect, and so bring up his children in rectitude. The parish was not a regime of compulsion more than any rule of right conduct of to-day. Worship is naturally inherent and is the foundation of religious life, and no well-ordered life exists without a time and place for everything. So every community for religious worship and instruction must have its metes and bounds, its corps of officers, its laws and by-laws and means of support.

Parishes grew up then as towns do now. New corporations in either case remove existing burdens and open new facilities for progress and prosperity. The inhabitants of this precinct were burdened in being so far remote from their respective places of worship. Boxford first parish, and Rowley second, were upon the west, Byfield upon the north, Rowley and Ipswich first parishes upon the east, and Topsfield parish upon the south. Central Linebrook is some four miles from either. Besides, many living within that distance would be better accommodated here; and with ample territory and consequently ample means, it was thought advisable to employ a religious teacher as early as 1739 or 40. Shortly afterwards the propriety of a corporate parish began to be discussed, and a petition was sent to the Great and General Court of Massachusetts Bay. Finally, a committee of that body

"repaired to the several parishes, took a view of the situation and circumstances and heard the parishes concerned," and submitted their report March 21, 1745, old style. "In Council June 4, 1746, it was ordered that the inhabitants and their effects by the report set off together with such other persons exempted as may join them within twelve months, be and are hereby erected into a distinct and separate precinct accordingly, and that they do duty and receive privileges as other precincts within the Province do or by law ought to enjoy, and that the charge of the committee amounting to 9£. 9s. 6p. be paid by the petitioners."

"Sent down for concurrence.

"J. Willard, Sec'y.

"Received and concurred in.

"J. Hutchinson, Speaker.

"Consented to.

"W. Shirley.

"Copy examined,

Pr Josiah Willard, Sec'y."

The warrant for the first meeting was issued by "the worshipful Jonathan Wade, one of his Majesty's Justices of the Peace for the county of Essex." It was directed to Abraham How, and he was requested "to notify and warn the freeholders and other inhabitants of the precinct qualified to vote in town affairs to assemble and meet at the meeting-house in said parish, on Monday, the 7th day of July next, at one of the clock afternoon." It was dated and signed: "Given under my hand and seal this twelfth day of June in the twentieth year of his Majesty's reign annoq: Domini 1746. Jonathan Wade Justc Pacis."

Mr. How made return of the warrant, and the first parish meeting was held according to its precept. George

Hibbert was chosen moderator; Mark How, clerk; and John Smith, Daniel Foster, George Hibbert, Jonathan Burpee and John Fowler, jr., a committee for calling future meetings. Thus the parish obtained its status, its right to command its parishioners and to tax their property.

The perimeter of the parish is in part composed of five different brooks, and it was, therefore, determined by vote Jan. 27, 1746–7, to name it Linebrook. Dec. 25, 1755, Dea. Jonathan Burpee, Sen. David Perley and Mark How were chosen a committee to join with the neighboring parishes in perambulating the line, which was described in the petition to the Great and General Court, and recorded in the parish records March 17, 1752, as follows:

In Ipswich, beginning at the mouth of Howlett's brook, so called, by the north side of Ipswich river; thence running northeasterly by said river till it comes to Gravelly brook, so called; thence running northerly by said brook across the West Meadows till it comes to John Smith's, to the west branch of Egypt river, so called, and by said river till it comes to the northeasterly corner of Bullbrook pasture so called; thence northwesterly including said pasture till it comes to where said pasture strikes Rowley line; thence westerly on Rowley line till it comes to Batchelder's brook, so called; thence northerly by said brook, including George Kilburn's and Thomas Wood's land on the east side of said brook, following the said brook till it comes to the easterly part of George Hibbert's land; then, as said Hibbert's land runs to the northwest corner thereof, including said Hibbert's land; thence running northwesterly as the line runs between Jonathan Burpee's and Aquilla Jewett's land to the brook, on which stands Mr. Tenney's grist-mill; so by the brook

to the said mill; thence by said brook till it comes to Straight bridge; still southwesterly on said brook including Aaron and Job Pingree's and Jedediah and David Kilburn's and David Perley's land on the north of said brook to an island in the Great Meadows, called Peabody's Island, to Boxford line; thence southerly as Boxford and Rowley line runs till it comes to the Ipswich line; thence as the line runs between Boxford and Ipswich, till it comes to the corner bounds between Ipswich, Boxford and Topsfield before Capt. Perley's door; thence as the line runs between Topsfield and Ipswich, till it comes to the first mentioned bounds at Howlett's brook.

Feb. 11, 1774, a part of the parish with the same part of the town of Ipswich was by the General Court set off to Topsfield. June 28, 1786, a law was passed wherein the bounds of parishes formerly settled were "confirmed and established." After the amendment to the State Constitution a law was made whereby all memberships of parishes must be preceded by an application in writing. In 1846, a part of Ipswich was set off to Boxford, but no mention was made of the parish, which was, therefore, uneffected. No other changes have come to our notice and the Linebrook of to-day includes parts of Rowley, Ipswich and Boxford — the original line except in the set-off to Topsfield. A parishioner, at first, as determined by Worshipful Wade's warrant for the first meeting, was an inhabitant of the precinct, qualified by law to vote in town affairs. By the law of June 28, 1786, a parishioner must pay, over and above his poll-tax, a tax equal to two-thirds of a single poll-tax. We know of no other restriction and no change in these. The Public Statutes of 1882 say: "Nothing in this chapter shall enlarge or diminish the powers of taxation enjoyed by

any religious society by virtue of any special law or act of incorporation, nor impair the existing right of property of any territorial parish." Thus Linebrook exists to-day, if these laws have been complied with,— exists at the age of one hundred and thirty-seven years, strong in her original powers and privileges, and only subject to the duties and liabilities of her youth.

The first meeting-house was erected in 1743. June 27, 1746–7, the parish voted to finish the house thus: First, the pulpit and deacon's seat; second, the body seats below; third, three fore seats in each gallery; fourth, the gallery stairs and plaster under the gallery; fifth, a pew for the parish. May 18, 1747, it was voted that the meeting-house be finished by the last of October. It was a two-story, square house, was furnished with box-pews, and was entered by a front door and a door on each side. Dec. 28, 1747, a committee was chosen to receive and receipt for a gift from Abraham Smith, and discharge the executor. They were also to paint the pulpit suitably and put on it the name of *Abraham Smith deceased.* This house stood about a third of the way on the road from the Ipswich-Linebrook school-house to the Rowley-Georgetown road. The building committee were John Smith, Thomas Potter, Mark How, Jonathan Burpee and John Abbott. The genealogy of the Fowler family reads that James Davis, who married Abigail Metcalfe, gave the land on which the house stood. The parish records read that the price of pew No. 11, bought by Joseph Metcalfe and Jonathan Burpee, was "3½ acres of land to build the house on." The house was removed to the location of the present church and rebuilt in 1828 and dedicated Jan. 1, 1829. The rebuilding followed the old model. The present church was erected in 1848.

Their method of psalm singing was quaint. The tuner,

as the leader was called, would read a verse or line and then strike some symmetrical movement, when all the organs vocal followed. In 1791, the singing-school was invited to assist the tuners, and their office began to decline.

No Ruling Elder was chosen after 1787. The deacons number twelve. Dea. William F. Conant, the present incumbent, has worthily and efficiently performed the duties of his office for fifty-two years. He has also been superintendent of the Sunday School, at intervals, about forty years. The school was established about 1818. No records of its progress or doings have been kept or are now. It is doing a good work, and has a membership of about fifty.

The church has had five settled pastors. Rev. George Leslie was the first. He was a native of Scotland, a graduate of Harvard College, a divinity student of Rev. John Emerson of Topsfield, was ordained here when the church was organized, married Deacon Burpee's youngest daughter, had eight children (six sons), removed to Washington, N. H., where he was installed in 1780, where he was offered and declined a professorship in Dartmouth College, and where his family sleep, save one son. He was an eminent scholar, intellectually powerful, and a pious and successful minister. Rev. Gilbert T. Williams succeeded. He was a native of New Jersey, a graduate of Dartmouth College, lived in the house Mr. Leslie owned and occupied, and was dismissed after a useful ministry of twenty-four years. He settled the next year in West Newbury, where a shock of palsy terminated his labors. He died at Framingham in 1824. Rev. Ezekiel Dow was the next pastor. He was born in Warren, N. H., where he now resides. He was installed Christmas, 1860, and he closed his pastorate in 1866. Mr. Dow's successor, 1866–1871, was Rev. Alvah M. Richardson, a

native of Woburn, a graduate of Amherst and Andover, a good, worthy and pious man, but an unsuccessful preacher. Rev. Benjamin Howe, our present pastor, succeeded him. Mr. Howe is a native of Linebrook; he fitted for college at Meriden, N. H., Academy, graduated at Amherst College, and at Hartford, Conn., Seminary. He is a worthy citizen, is generous and charitable, a good and diligent student, a faithful and fairly successful preacher, a pious man. The infirmities of age have unfitted him for parochial duties, except on occasions, and he has retired to his farm in Hudson, N. H. *Serus in cœlum redeas.*

There have been stated supplies by the Rev. Messrs. David Tullar, Moses Welch, J. W. Shepard, Eliphalet Burchard, E. E. Abbott and J. W. Healy, now Doctor of Divinity and President of Sierra Madre College, Pasadena, California, and others, whose labors have been blessed with fruitful harvests.

The internal life of the church has been an average harmony. Her worldly goods and favors have been scanty, yet in moral worth and religious fervor she has kept abreast of her sisters. The Master of the Vineyard has evidently been lovingly watchful of his own, as attested by his Spirit. The membership now is forty-nine, about forty of whom are residents.

Through all these years the church has been a power for good; and no well-minded, thoughtful parishioner, who loves his own, who cherishes his neighbor, who seeks good society, who would purify social life, who would help to elevate the moral standard, would throw wholesome influences about his children, and so make his own name redolent with praise,— will stand complacently by and see the old society need any good thing.

## A Day in Groveland, Wednesday, August 15, 1883.

The meeting this day was held by invitation of the Groveland Flower Mission, and was one of much enjoyment.

It was attended by a good delegation from Salem, and in the afternoon by many representative citizens of the immediate neighborhood. At the station, on the arrival of the morning train, was a committee who kindly guided the visitors to the places of interest.

Some passed the forenoon exploring the fields along Johnson's Creek, above the Boston and Maine Railroad Station and Palmer's Creek, which finds its way to the river, a short distance below Balch's Grove, in quest of plants, a good collection of which was made for the afternoon session.

Among those who visited the "Great Rock" was Mr. Alfred Osgood of Newburyport, who says it is a boulder of apparently fifteen tons, resting upon three smaller stones; it is of diorite, the prevailing rock of this vicinity, which consists of feldspar and hornblende. Those who did not join the excursionists went to Balch's Grove, the place for the meeting, which is a very attractive spot, bordering on the Merrimac River. It is extensive in area, and is made up of some open level land and a hill which extends, we should judge, almost or quite half a mile in the direction of the Groveland bridge. The eastern termination of this hill rises from the river's pathway as a steep bluff, and from the cleared space at the summit a very fine river-view may be obtained, which includes the hills and wooded banks opposite, the river below until it winds out of sight and the flourishing city

of Haverhill above. Steamers and tug boats were from time to time seen going up and down the river, and an occasional sail or row boat contributed to the attractiveness of this beautiful, historic and very important industrial stream.

The lunch was served on the grounds, and our hosts showed great hospitality in their courteous and kind attentions.

The afternoon session was held in the pavilion at 2.30 P. M. The President made a few preliminary remarks, in which he spoke of previous visits of the Institute to Groveland, the first being in 1837, when they were received in the Academy Hall, Rev. Dr. Perry and preceptor Morse being much interested in the work of the Institute. Another visit was in 1872, the meeting being in the new Academy Hall.

Miss HARRIET E. PAINE, the President of the Groveland Flower Mission, was then introduced, who gave a very interesting account of the botanical rambles, showing a variety of plants gathered, some of which are not found in the surrounding towns, and others which are rare, comprising in all some seventy-six species. She subsequently read a list of some of the plants to be found in Groveland which are not mentioned by Mr. Robinson in his "Flora of Essex County."

In the course of her remarks she alluded to the fact of occasionally finding plants not previously noticed; the seeds, from which they germinated, were probably brought down in the waste from the mills above. A partial list of the plants above alluded to is hereto appended.

Hon. GEORGE B. LORING, U. S. Commissioner of Agriculture, was introduced to speak upon the subject of

"Forestry," which had just been engaging his attention at the west. Before proceeding to that subject, however, he spoke a pleasant word for the fidelity of Mr. W. P. Conant, an associate member of the Institute who is doing faithful work in the Agricultural Department at Washington in the collection and classification of the grasses. He spoke of the Merrimac River and its associations with matters of history, and of the vast importance of its many and varied industries at Manchester, Lowell, Lawrence and other places, contrasting them with the woollen industry by hand process of the olden time.

After briefly alluding to the leather and other industries, he then spoke of the lumbering business and its growth within the past fifty or sixty years; formerly it was considered as being identified exclusively with Bangor. The activity of the woodman in destroying our forests is raising the question of the future supply. If it continues at the rate it has been going on in Maine, the supply will be exhausted in eight or ten years. In Michigan, Wisconsin, and other western states, it will be but a few years before similar results will follow. But in Texas, rating from the past it would take 250 years to exhaust the supply, and in South Carolina 150 years. While lumbering is disappearing along the northern belt, there is a belt of lumber standing along the Gulf States. The south now wants the activity and energy of New England, and this will be one of the stepping-stones by which this section will become prosperous and enterprising. While these remarks had more particular reference to pine, he spoke also of ornamental woods. At St. Paul's he had been presented with a gavel made of hickory, which was very handsome. Of all the many and various woods in the collection at Washington there were none

that would compare with the beauty of some of the southern pines or that of the ornamental woods in which the country abounds. Dr. Loring spoke of the importance of impressing upon the public mind the necessity of preserving our woods. This can be done by taking the same care of the cut woodlots that is taken of the cornfield. The woodland should be protected the same as any other land. Pine wood will make a growth in twenty years; oaks and hard woods, as a rule, in about forty-two years. Wherever a man goes trees follow him. Trees will grow anywhere and will grow plentifully. It is only necessary that the ground should be cultivated. Many trees are not to be transplanted, but planted; those that are indigenous to the soil do best. He said this might seem to be a small question by the side of the great crops of the country, but it was one of great importance.

Hon. N. A. Horton, of Salem, presented a few brief sketches from the history of Groveland. He spoke of the Old Parish Church, organized June 7, 1727. The first occupant of its pulpit was the Rev. William Balch; he died Jan'y 12, 1792. His successor was the Rev. Ebenezer Dutch ordained colleague-pastor Nov. 17, 1779, who died Aug. 4, 1813, at the age of sixty-two. He was followed by Rev. Gardner Braman Perry,[1] who died Dec. 16, 1859, having been in the active service of the ministry over thirty-six years.

Rev. Mr. Perry is represented as a man of more than ordinary ability as a preacher, and stood high in his denomination. He appeared to have that faculty of discreetness which was capable of giving a strong moral sup-

[1] Rev. Gardner Braman Perry, D. D., son of Nathan and Phebe (Braman) Perry, born at Norton, Mass., Aug. 9, 1783; gr. Union College, 1804; ordained Sept. 28, 1814. See Bulletin Essex Inst., Vol. IV, 106.

port to the reforms of the times without the misfortune of antagonizing any party. He was a promoter of temperance reformation and a sympathizer with the anti-slavery cause. He was a man of much public spirit and was interested in the promotion of works to benefit the town and the public.

Mr. Horton then spoke of the late Dr. Jeremiah Spofford,[2] who died in this place a few years ago, at an advanced age. He alluded to him as a man whose opinions were always strong and decided, and a fair type of that old-fashioned citizenship which constituted the best life of New England, and to the influence of which this state and country must look for prosperity and permanence in the future. He then proceeded to read, with here and there a passing comment, a dozen short extracts from an address delivered by Dr. Spofford in the First Church, Groveland, June 22, 1867. It was published at that time in a pamphlet entitled "Reminiscences of Seventy Years, including Half a Century in the Practice of Medicine in this Place." It was a mixture of autobiography and town history.

After some remarks from Dr. Loring and Dr. George Cogswell, of Bradford, in reference to Rev. Dr. Perry and Dr. Jeremiah Spofford, and the passing of a vote of thanks to the Flower Mission of Groveland, and to Mr. Balch, the proprietor of the grove, for courtesies extended during this pleasant visit to Groveland, the meeting adjourned.

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[2] Jeremiah Spofford, son of Jeremiah and Temparence Spofford, born at New Rowley (Georgetown), Dec. 8, 1787, removed to East Bradford (Groveland), in 1817, died Sept. 16, 1880. See Bulletin Essex Inst., Vol. IV, 108.

## PLANTS SHOWN AT THE MEETING IN GROVELAND, MASS., AUGUST, 1883

BY MISS HARRIET E. PAINE.

Ranunculus Flammula, var. reptans (Creeping Spearwort).
Actea rubra } fruit (Red Baneberry).
" alba } fruit (White Baneberry).
Hypericum ellipticum (St. John'swort).
" corymbosum (Common St. John'swort).
" mutilum.
Ceanothus Americanus (fruit); a plant from which tea was made during the Revolution). (New Jersey Tea).
Desmodium Canadense.
Lythrum Salicaria (Spiked Loosestrife).
Cicuta bulbifera (Cowbane).
Sium lineare (Water Parsnip).
Liatris scariosa (Blazing Star).
Solidago latifolia.
" lanceolata.
Krigia Virginica (Dwarf Dandelion).
Hieracium Canadense.
" venosum (Rattlesnake Weed).
Lobelia Cardinalis (Cardinal Flower).
Campanula rotundifolia (Harebell).
Lysimachia ciliata.
Mimulus ringens (Monkey Flower).
Gratiola aurea.
Scutellaria lateriflora (Mad-dog Skullcap).
Cuscuta Gronovii (Dodder).
Laportea Canadensis (Wood-nettle).
Carya alba (fruit) (Shagbark Hickory).
Peltandra Virginica (fruit) (Arrow Arum).
Goodyera repens.
Dulichium spathaceum.
Zizania aquatica (Indian Rice).
Spartina cynosuroides (Salt Marsh Grass).
Bromus ciliatus.
Andropogon furcatus.
" scoparius.
Equisetum hyemale (Scouring Rush).
Struthiopteris Germanica (Ostrich Fern).
Cystopteris fragilis, var. dentata.
Buxbaumia aphylla.

## GROVELAND PLANTS NOT REPORTED BY MR. ROBINSON IN COUNTY FLORA.

BY MISS HARRIET E. PAINE.

Lythrum alatum, a few blossoms near a creek flowing from a woollen factory.

Penstemon Digitalis, found in several places, one of them an old field where it could not have been introduced with western grain.

Trillium album and Trillium declinatum, in a rich meadow where all the intermediate steps between T. cernuum and T. erectum may be found, some of the plants also varying in the direction of T. sessile and T. erythrocarpum. In the same meadow has been found one plant of a Salix which has not yet been identified by any of the four or five botanists who have seen it. It was not more than one or two feet in height, and further search in the meadow has failed to discover any trace of more.

Allium Schœnoprasum.

Buxbaumia aphylla.

Fegatella conica.

The above were mentioned at the Institute, with the exception of the Willow. Since then, the following have been added to the list, as well as many *varieties* of plants, particularly of lichens.

Sanicula Canadensis.

Houstonia purpurea, a var.

Solidago gigantea.

Bidens cernua.

Penstemon pubescens.

Rumex glomeratus.

Pertusaria multipuncta.

## Field Day at West Peabody, Wednesday, Sept. 19, 1883.

By invitation of the West Peabody Farmers' Club, a meeting was held this day at the Schoolhouse Hall in West Peabody. The members of the Institute and their friends began to assemble at 10 A. M., and were cordially received by a committee of the Farmers' Club, consisting of the President, Mr. Taylor, and Messrs. Upham, Henderson, Viles and Farwell. The company was divided into excursion parties, and under the direction of members of the Club visited several places of interest in the fields and woods. The farms of Messrs. Henry Saltonstall, Francis H. Appleton, William P. Upham and Joseph Henderson were visited, and every facility was extended to examine these well laid-out grounds, extensive barns filled with hay and other crops, fine breeds of stock, and the various new and improved implements used in the general management of the farm.

These are in striking contrast with the system adopted and the means employed in carrying on large farms some fifty years ago. Similar improvements are perceptible in all the other industries of this county. The agricultural keeps pace with the mechanical, the commercial and manufacturing.

A botanical ramble was organized under the direction of Mr. John H. Sears, and many places of interest were visited.

At one o'clock the various parties reassembled for lunch, and at an hour and a half later the afternoon session was held.

The President in the chair. After a few introductory remarks, he called upon Mr. John H. Sears who gave, in a very pleasant manner, the results of the botanical ramble

showing a variety of plants which were collected. Many of the species were those that are usually found at this season in similar localities in this vicinity: others were rarities of considerable interest. He spoke of the *Gentiana crinita* (Fringed Gentian), *Veronica americana* (Brook Lime), *Parnassia caroliniana* (Grass of Parnassus) and of some of the species of Solidago and Asters. In a small pond near the residence of W. P. Upham, Esq., he collected specimens of *Polygonum amphibium*.

Mr. George Dixon, an English gentleman now residing in Virginia, spoke of the English grasses and of the English sparrow. He is of the opinion that we shall find this sparrow to prove troublesome ere long.

Mr. William P. Upham read a paper giving an account of the early settlements in West Peabody, the bounds and landmarks of many of the farms and estates and the traditions relating thereto that have come down in the old families. This paper was referred to the publication committee, and will appear in the Historical Collections.

Messrs. James F. Ingraham, Willard Spalding, James P. King, Joseph Henderson, all of West Peabody, Woodbury P. Conant, of the U. S. Agricultural Department, and J. S. Kingsley made appropriate and interesting remarks.

The Secretary offered the following vote which was unanimously adopted.

*Voted*, That the thanks of the Essex Institute are due and are hereby tendered to Messrs. Harrison Taylor, W. P. Upham, Bowman Viles, James P. King, John E. Hedrick, Joseph Henderson, Edwin C. Farwell and other members of the West Peabody Farmers' Club, for the many kind attentions tendered during the day; also to the town authorities for the use of the schoolhouse for the purposes of the meeting. Adjourned.

# REMARKS
# UPON SOME CHIPPED STONE IMPLEMENTS.

BY F. W. PUTNAM.

(*Communicated at the meeting on June* 29, 1883.)

Vice-President PUTNAM addressed the meeting on the subject of "American Archæology." After a general statement of the importance of studying the works of man in the past, not only in order to obtain an insight into the condition and development of the early races, but also, by comparison, to trace their connections and migrations over the world, he confined his remarks to the method of manufacture, the character and use of chipped stone implements. The subject was illustrated by several photographs and drawings which he brought from the Museum at Cambridge, and by the local collection exhibited to the meeting by Mr. Dodge.

The first cutting implements used by man, to supplement his finger nails and teeth, probably consisted of pieces of stone, broken shells, the teeth of animals and splinters of bone or wood, according to the particular circumstances and surroundings of the individual. While such natural and primitive implements are still in use by the lower savages, and in emergencies are resorted to by us all, the natural wisdom of man, as shown by his great inventive power in his onward march, soon led him to prepare implements better adapted to his purposes. Thus, among the very oldest works of man, of which we have positive knowledge, are the chipped stone imple-

ments found at greater or less depth in the gravel beds of various parts of the world; such as those discovered by Dr. Abbott in the gravel of the Delaware valley at Trenton, N. J., of which figs. 1 and 2 are representations.

Implements such as these were made readily from any kind of stone which fractures with a sharp edge, and they were formed by striking off pieces with another stone which served as a hammer. In each locality the stones which have this essential character soon became known and hence we find that chipped implements made of the several varieties of slate, jasper and quartz are abundant in this vicinity, while in other parts of America flint or chert, obsidian, chalcedony and other kinds of stones were used.

A variety of argillite was the material in common use among the people inhabiting the valley of the Delaware at a time so remote that we are unable, as yet, to express it in years. While we cannot affirm that the rudely-made implements found in the Trenton gravel were fastened to handles, it is probable that they were, as we know that similar implements are furnished with handles by savages probably as low in the scale of humanity as were the ancient men of the glacial epoch. Figures 1 and 2 represent two of the argillite implements from the Trenton gravel.

Fig. 3 is an illustration of a rude stone implement provided with a handle, from Tasmania. The handle is simply a tough twig which has been cut or scraped flat on one side and then bent over the stone; the flat surfaces of the twig coming together below the stone are secured in place by a string and form a rounded handle. A similar method may have been followed in hafting the rude implements found in the gravel.

Another primitive form of cutting implement is shown

in fig. 4. This is from Australia, and was made by fastening sharp fragments or flakes of stone to a stick by means of a tenacious gum. It is a good illustration of the manner in which flint and other flakes may have been mounted for use as saw-like knives by North American tribes. The original of this figure is in the collection of the Peabody Academy of Science, Salem.

Another rude but efficient form of knife is shown in fig. 5. This is simply a large flake of striped gray flint, slightly chipped along two of its edges. It was taken from an Indian grave in southern California, and is described with several others of a similar character in Vol. VII, Report of Lt. Wheeler's survey west of 100th meridian. Fragments of the wooden handle and some of the asphaltum with which it was fastened, are still attached to the base of the stone. Such flint knives without their handles are common, and are often called rude arrowheads or spearpoints, although by most archæologists they are termed flake-knives or trimmed flakes. A flint knife with its wooden handle is shown in fig. 6. This also was from an Indian grave near Santa Barbara, California. Numerous other specimens of this character have been found in graves in southern California. It is seldom the case that the wooden handle is preserved, although the asphaltum with which the blade was fastened to the handle often remains attached to the stone.

In other regions different substances were used for securing the blade to the handle. Among many interesting objects taken from bundles containing human skeletons,[1] found by Dr. Edward Palmer in the burial caves of Coahuila, Mexico, and now in the Peabody Museum

[1] See Reports Peabody Museum Arch. and Ethn., Cambridge. Vol. III, p. 233.

at Cambridge, are large, thin and well-chipped points of flint which are fastened to short handles, by means of a tenacious substance probably obtained from the cactus. Representations of seven of these knives from two burial caves are given in figures 7-13, as they form a very interesting addition to our knowledge of at least one of the methods of mounting the large chipped points, and they also show that not all such points were spearheads.

Although large rude implements, like those from the Trenton gravel, were made by simply chipping off pieces so as to leave a rough cutting edge or a point, the delicately flaked knives from the Mexican caves required additional work of a higher character.

The art of making arrowheads and similar objects out of stone is often stated to be one of the lost arts; but this is not the case, since at the present time there are many Indians in this country, who continue to manufacture them, and even work pieces of glass bottles into symmetrical and delicate arrowpoints. The method of making the points has been described several times by eye-witnesses, and although there is a difference in detail according with the material used and the skill of the workman, the manufacture may be described in general terms as follows:

A piece of that particular kind of stone, which experience has shown to be the best attainable for the purpose, is selected and roughly shaped by striking blows with a hammer-stone. If it is found to chip readily, it is shaped still further by light blows along the edges, each blow striking off a chip. Partly wrapped in a piece of skin, it is then held in the left hand and finished by flaking off little bits. This delicate part of the work is done with a flaking tool made usually of a piece of bone or antler. This

is a few inches long and about half an inch wide, having one end rubbed down to a blunt edge, which may be either straight, pointed or notched. The other end is fastened to a piece of wood so as to give a firm support to the hand. Sometimes this wooden handle is long enough to be held under the arm, thus steadying the implement which is grasped by the right hand. The edge of the flaker is pressed firmly against the edge of the stone, then with a slight rotation of the wrist a small flake is thrown from the edge of the stone. It will be found that, with a little practice, this flaking can be done with considerable rapidity and precision. Some stones flake better after being heated. The numerous forms of chipped implements known as scrapers, drills, knives, spearpoints and arrowheads, which are represented in the collection before us, probably were made by a method similar to this which I describe. Presumably the smaller are arrowheads which were mounted in various ways.

A mounted point, which may have been either a heavy arrow or a javelin, is shown in fig. 14. It was found in an ancient grave near Arica, Peru, by Mr. J. H. Blake. The point is of quartz and is held in the socket by the string which passes over the barb and is wound round the end of the wooden shaft. The other end of the wood is so shaped as to lead to the conclusion that it was set into a shaft like the more slender piece which forms part of the arrow shown in fig. 15. Both specimens were found by Mr. Blake in the same grave. The more delicate quartz point of the latter is set in a hole in the end of a piece of hard wood and held fast by gum or pitch. The thread was wound round the wood simply to keep the piece from splitting. This piece was then set in a hollow reed which formed the long shaft of the arrow. This

method of mounting arrowpoints is common in North America. Figs. 16, 17 and 18 represent arrows made by the Navajo and Pah-Ute Indians. In these the points, which are of chalcedony and obsidian, are fastened in a notch at the end of the wood with pitch and a lashing of sinew. The piece of wood is then set in a hollow reed, as shown in fig. 16*a*; the end of the reed being wound with sinew to prevent its splitting. Another mode of mounting is shown in fig. 19. It is an arrow made by the natives of Tierra del Fuego. The point is chipped from a piece of bottle glass, and is fastened directly in a slot at the end of the wooden shaft by binding firmly with a sinew without the aid of any pitch or gum.

FIG. 1.

FIG. 1. IMPLEMENT OF ARGILLITE FROM THE TRENTON GRAVEL. $\frac{1}{1}$

FIG. 2.

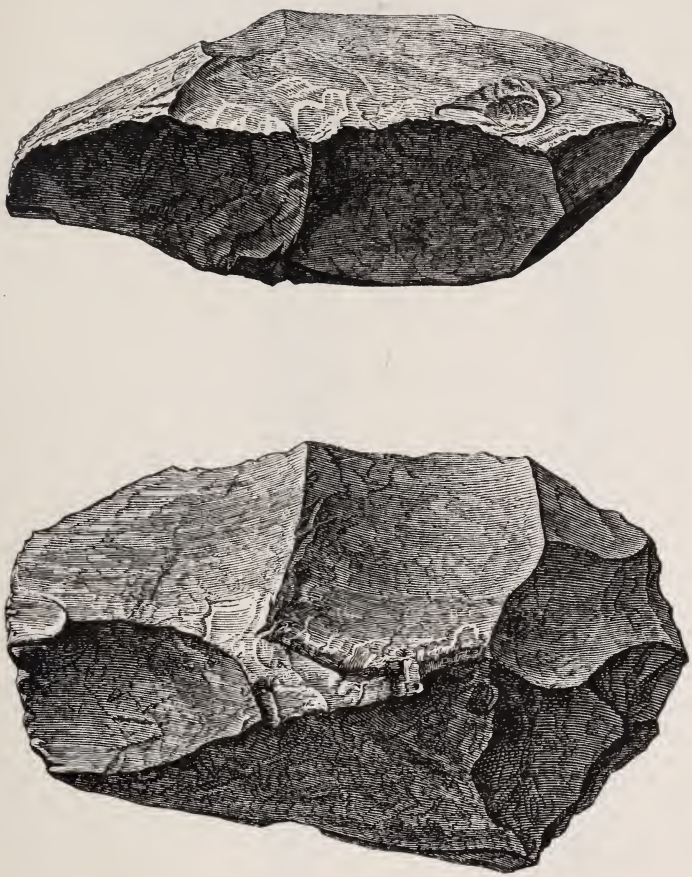

FIG. 2. TWO VIEWS OF AN IMPLEMENT OF ARGILLITE FROM THE TRENTON GRAVEL. $\frac{1}{1}$

FIG. 3.

FIG. 4.

FIG. 3. RUDE STONE AXE IN A WOODEN HANDLE. $\frac{1}{3}$ FROM TASMANIA.
FIG. 4. STONE CHIPS FASTENED BY GUM TO A WOODEN HANDLE. $\frac{1}{3}$ FROM AUSTRALIA.

FIG. 6.

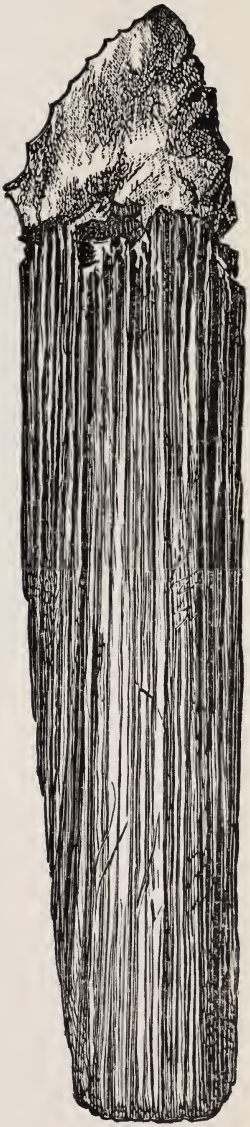

FIG. 5.

FIG. 5. FLAKE KNIFE WITH REMAINS OF WOODEN HANDLE. $\frac{1}{1}$

FIG. 6. RUDELY CHIPPED STONE KNIFE IN WOODEN HANDLE. $\frac{1}{1}$

FROM GRAVES NEAR SANTA BARBARA, CALIFORNIA.

Fig. 7.

Fig. 8.

Figs. 7, 8. Flint Knives in wooden handles. $\frac{1}{2}$
From Burial Cave in Coahuila, Mexico.

FIG. 9.

FIG. 10.

FIGS. 9, 10. FLINT KNIVES IN WOODEN HANDLES. ½
FROM BURIAL CAVE IN COAHUILA, MEXICO.

Fig. 11.

Fig. 12.

Figs. 11, 12. Flint Knives in wooden handles. $\frac{1}{2}$
From Burial Caves in Coahuila, Mexico.

FIG. 14.

FIG. 13.

FIG. 15.

FIG. 13. FLINT KNIFE IN WOODEN HANDLE. $\frac{1}{2}$ FROM CAVE IN COAHUILA, MEX.
FIG. 14. QUARTZ POINT IN WOODEN SOCKET. $\frac{1}{1}$ FROM GRAVE IN ARICA, PERU.
FIG. 15. ARROW POINT WITH SHAFT OF WOOD AND REED. $\frac{1}{4}$ FROM GRAVE IN ARICA, PERU.

FIG. 16*a*.

FIG. 16.

FIG. 17.

FIG. 18.

FIG. 19.

FIGS. 16–18. NAVAJO AND PAH-UTE ARROWS. $\frac{1}{1}$ 16*a*, SHOWS JOINING OF THE WOODEN PORTION OF SHAFT WITH THE REED.
FIG. 19. ARROW FROM TIERRA DEL FUEGO. $\frac{1}{1}$